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Research Paper

Cabbage production in Kolar district of Karnataka : An economic analysis

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ABSTRACT : India is the second largest producer of vegetables in the world next to China. The cabbage is the major vegetable crop of Karnataka. The study was conducted in kolar district on cost of cultivation and returns on different cost concepts basis of cabbage. The result reveled that, production is normally considered as the function of area and yield. The decision regarding the choice of crop enterprise to be taken on the farm and the allocation of area and resources under it depends to a great extent, on level of yield, price of output and the cost of inputs used in the production of that crop. The cost of cultivation and the returns to different factors of production help in decision making about the selection of crop and hence, these measures were worked out for cabbage. On an average, Rs.42,873 was spent on cabbage per hectare. Cost of cultivation of by the small size farms were high (Rs. 44671/ha) as followed by medium and large size farms (Rs.42002/ha and Rs.41946/ha). And the cost of production per quintal in different size of farms group was Rs.669.43/ha, respectively. The cabbage price per quintal in market was Rs.1700. The sample average for Cost A_1, Cost A_2, Cost B and Cost C in different farms size groups were Rs.30453/ha, Rs.33953/ha and Rs. 37906/ha and Rs.42873/ha, respectively. And farm business income and family labour income in different size of farms group were Rs.75010/h and 755540/ha. An average of net return obtained from cabbage growers per hectare was Rs. 62504/ha.

KEY WORDS : Cabbage, Cost returns, Cost of cultivation, Cost of production, Returns

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INTRODUCTION :

India is a leading vegetable producing country in the world. The country is blessed with a unique gift of nature of diverse climate and distinct seasons to make it possible to grow good number of vegetables in an area of 7.05 m.ha with the annual production of 108.20 m.t (Agriculture today, 2013-14). Karnataka state is one of the leading vegetable producing state in the country with a production of 45,78,600 tonnes, vegetables grown over an area of 3,82,200 ha(APEDA, 2012-13) of which, cabbage occupies a major area of 47.2 thousand hectare with a production of 1,285.1 thousand tonnes (National Horticulture Board, 2013-14), contributing 8.5 per cent to the total major vegetable production in India. The vegetable crops have been well advocated in solving the problem of food security, since they are rich source of minerals, vitamins, fibre and contain fair amount of protein as well as carbohydrates.

Karnataka is blessed with ten agro-climatic regions

suitable for growing variety of fruits and vegetables round the year. The major districts growing horticultural crops in the state are Kolar, Hassan, Kolar, Kodagu, Bengaluru, Shimoga, Bijapur and Dharwad. The state stands at eighth position with respect to area and production of vegetables. Kolar is the major vegetable producing district in the southern Karnataka, with an area of 49,576 ha and production of 6,77,706.56 t, respectively. The total area and production of cabbage in Kolar district is 4806.70 hectares and 1,61,170.00 tonnes, respectively (Source: DDH Office, Kolar 2014-15).

In Karnataka the area under vegetables cultivation is 4,050 ha (National Horticulture Mission Report, 2013-14). According to Ministry of Agriculture, Govt. of Karnataka there are certain policies and schemes to educate farmers about vegetables cultivation and various training programmes in districts and blocks in Karnataka and is providing funds to the Non- Governmental Organizations and each organization has a target to cover 1500 farmers and for that they are paying Rs. 200 per farmer per year to the NGO's to support the farmers. The Government of Karnataka has made separate cell called 'vegetables cell' especially for the farmers.

Bala *et al.* (2011) studied the costs and returns structure for the production of major off-season vegetables in Kullu and revealed that per hectare cost A1 was highest for tomato, followed by cabbage, cauliflower and lowest for peas, among the selected vegetables. However, per quintal cost of cultivation has been found to be highest for peas, followed by cauliflower, tomato and cabbage. Costs on plant protection measures have been the major constituents of cost A1 in all the crops, followed by expenditure on seed and fertilizers. Vegetables being the labour-intensive crops, have incurred significantly high costs on human labour, Rs. 13200, Rs. 15600/ha. Gross returns as well as net returns per hectare have been observed to be highest for tomato, followed by cauliflower, cabbage and peas. The present study was undertaken to study cost of cultivation and returns on different cost concepts basis of cabbage.

MATERIALS AND METHODS :

A sample of 65 cabbage growing farmers from different land size categories was selected by probabibility proportion to number of farmers in each size group. For the selection of farmers, a complete list of all the vegetable growers of selected villages was prepared and arranged in ascending order on the basis of area under selected crop. The farmers were categorized as small, medium and large by cumulative total method on the basis of area under vegetable crop. A sample of 27, 22 and 16 farmers from each selected village was selected by probability proportion to number of farmers in each size group holding.

Describe statistics was used to study the type, pattern of input use, yield level and market price. The averages and percentages were worked out for the same. The following farm management cost concepts were used for calculating the cost per hectare of cabbage crop. The classification of costs based on Dr. Sen's Committee report (Sen, 1979) is as follows.

Cost - A1:

It included wages of hired human labour, cost of bullock, charges of hired machinery, cost of seed, value of organic manure and chemical fertilizers, value of plant, interest on working capital, depreciation farm machinery, implements, equipments, farm buildings, land revenue etc.

Cost - A2:

Cost 'A1' plus rent paid for leased in land.

Cost - Cost 'A1' or 'A2' plus interest on fixed capital invested in the business excluding the value of the land.

Cost - B2:

Cost 'B1' plus rental value of own land.

Cost - C1:

Cost 'B1' plus imputed value of family labour.

Cost - C2: Cost 'B2' plus imputed value of family labour.

RESULTS AND DATA ANALYSIS :

The result and discussion of the study as like this,

Cost structure of cabbage household cultivation:

Cost structure incurred by different size of farms total cost in depicted in Table 1. Total cost of cultivation for small farmers was higher Rs.44671/ha followed by medium and large size farms (Rs.42002/ha and Rs.41946/ha). Cost of cultivation for the overall sample was Rs.42873/ha. The cost of human labour, fertilizers, seeds and bullock labour were the items of cost with major

share in the variable costs, because most of the operations like harvesting, and weeding were human labour intensive operations and the other operations like land preparation and intercultural operation were bullock labour intensive. The distribution of pattern of operational cost under various inputs revealed that cost of human labour was the highest in the large size farms (Rs. 4540/ha), followed by medium size farms (Rs.4257/ha) and lowest on small size farms (Rs.3949/ha). Whereas, bullock labour cost was the highest in case of small size farms (Rs.1500/ha) as followed by medium (Rs.1500/ha) and large farms (Rs. 900/ha). Machinery labour cost was the highest in case of small size farms (Rs. 3325/ha) as followed by medium (Rs. 2375/ha).

The cost of seedling was the highest on small size farms (Rs. 4740/ha), medium size farms (4500) and lowest in large size farms (Rs.4350/ha). The expenditure on farm yard manure ranged from Rs.1964/ha (small size farms) to 1690/ha (large size farms). Whereas, the expenditure on fertilizers was the highest (Rs.4581/ha) for small size farms than medium size farms (Rs. 4540/ ha) and large size farms (Rs. 4530). It was also noticed that the highest expenditure on pesticide was seen on small size farms (Rs. 4442/ha) as followed by medium and large size farms (Rs. 3340/ha and Rs.3410/ha), respectively. Sample average for depreciation on fixed resources was Rs.1434, interest on working capital Rs.3263 and interest on fixed capital was Rs. 956.

Rental value of own land was Rs.3000/ha and rent paid leased in land was Rs. 3500/ha for all different

Table 1: Cost structure of cabbage household cultivation in study area **(Rs. per ha)**

Sr. No.	Particulars of farm operations	Cabbage farm household			
		Small (n=27)	Medium (n=22)	Large (n=16)	Sample average (n=65)
1.	Hired human labour charges (Rs.)	3949.00 (8.84)	4257.00 (10.13)	4540.00 (10.82)	4249.00 (9.93)
2.	Bullock labour charges (Rs.)	1500.00 (3.35)	1500.00 (3.57)	900.00 (2.14)	1300.00 (3.02)
3.	Machinery labour charges (Rs.)	3325.00 (7.44)	2375.00 (5.65)	3325.00 (7.92)	3008.00 (7.00)
4.	Cost of seedlings	4740.00 (10.61)	4500.00 (10.71)	4350.00 (10.37)	4530.00 (10.56)
5.	Cost of farm yard manure	1964.00 (4.39)	1850.00 (4.40)	1690.00 (4.02)	1835.00 (4.27)
6.	Cost of chemical fertilizers	4581.00 (10.25)	4590.00 (10.92)	4821.00 (11.49)	4664.00 (10.89)
7.	Cost of irrigation charges	2050.00 (4.58)	2050.00 (4.88)	1990.00 (4.74)	2030.00 (4.73)
8.	Cost of plant protection	4442.00 (9.94)	3340.00 (7.95)	3410.00 (8.12)	3730.00 (8.67)
9.	Miscellaneous charges	350.00 (0.78)	340.00 (0.80)	320.00 (0.76)	336.00 (0.78)
10.	Interest on working capital @ 6%	3240.00 (7.25)	3320.00 (7.90)	3120.00 (7.43)	3226.00 (7.53)
11.	Deprecation on fixed resources	1450.00 (3.24)	1420.00 (3.38)	1430.00 (3.40)	1433.00 (3.34)
12.	Land revenue paid to Government	110.00 (0.24)	110.00 (0.26)	110.00 (0.26)	110.00 (0.25)
13.	Rental value of leased land	3500 (7.83)	3500 (8.33)	3500 (8.34)	3500 (8.17)
14.	Interest on fixed capital @ 10%	970.00 (2.17)	950.00 (2.26)	940.00 (2.24)	953.00 (2.22)
15.	Rental value of own land	3000.00 (6.71)	3000.00 (7.14)	3000.00 (7.15)	3000.00 (7.00)
16.	Imputed value of family labour charges	5500.00 (12.31)	4900.00 (11.66)	4500.00 (10.72)	4966.67 (11.56)
17.	Total cost of cultivation per ha	44671.00 (100.00)	42002.00 (100.00)	41946.00 (100.00)	42873.00 (100.00)

Table 2: Economics of cabbage cultivation in study area **(Rs. per ha)**

Sr. No.	Particulars	Cabbage farm household			
		Small (n=27)	Medium (n=22)	Large (n=16)	Sample average (n=65)
1.	Total cost of cultivation	44671.00	42002.00	41946.00	42873.00
2.	Yield in (q)	65	64	63	64.00
3.	Gross returns per hectare	110500.00	108800.00	107100.00	108800.00
4.	Net returns per hectare	65829.00	66798.00	65154.00	65927.00
5.	Cost of production per quintal	687.24	656.28	668.80	670.77
6.	Input : Output ratio	1:2.47	1:2.59	1:2.55	1:2.53
7.	Price per quintal	1700.00	1700.00	1700.00	1700.00

categories of farmers.

Economics of cabbage cultivation in study area:

In Table 2 cost and returns in cabbage cultivation for different size of farms. Among different size of farm groups, the total cost of cultivation incurred by the small farms were high (Rs. 44671/ha), followed by medium (Rs. 42002/ha) and large farms (Rs.41946/ha). Sample average for total cost of cultivation was Rs.42873/ha. The gross returns obtained per hectare by small size farms were high (Rs. 110500/ha) as compared to medium and large size farms (Rs. 108800/ha and Rs.107100/ha), respectively. The net returns per hectare obtained by small size farms were high (Rs. 65829/ha) as followed by medium and large size farms (Rs. 66798/ha and Rs. 65154/ha, respectively). The average yield of cabbage in different size of farms group was Rs.64qtl/ha. The yield was highest in case of small size farms 65qtl/ha as followed by medium (64qtl/ha) and large size farms (63ha/ha). Average cost of production per quintal was Rs. 670.77/qtl. Gross price per quintal for all categories was of farms was Rs. 1700. Input – output ratio was in highest medium size farms (1:2.59) followed by large size farms (1:2.59) and in lowest small size farms group (1:2.47).

Cost concepts in cabbage production in the study area (Rs. per ha):

Table 3 revealed that the cost concepts in cabbage production for different size of farms per hectare. Cost A_1 was highest in small size farms (Rs. 31701/ha) followed by large size farms (Rs.30006/ha) and lowest in medium size farms (Rs. 33474/ha). Cost A_2 in small, medium and large size of farms groups was Rs.35201/ha, Rs.33152/ha and Rs.33506/ha, respectively. Cost B was highest in small size farms (Rs. 391717/ha) as followed by large size farms (Rs. 37446/ha) and lowest in medium size of farms (Rs.37102/ha. Cost C was highest in small size farms (Rs.44671/ha) and lowest in large size farms (Rs.41946/ha) and highest in small size farms (Rs.42661/ha). Sample average for Cost A_2, Cost B and Cost C was Rs.33953/ha, Rs.37906/ha and Rs.42873/ha (Jose and Jayashekhar, 2009).

Measures of profitability in cabbage cultivation across different farms size in study area:

Table 4 gross returns obtained per hectare by small size farms were high (Rs.110500/ha) as compare to medium size farms (Rs.108800/ha) and large size farms (Rs.107100/ha), respectively. The sample average for gross returns was 108800/ha in different size of farms group. Farm business income in small, medium and large size of farms group was Rs. 78799/ha, Rs. 75648/ha and Rs. 73594/ha, respectively. Sample average of different farm groups for farm business income was Rs.75010/ha in different size of farms group. Farm investment income was compared in small size farms (Rs.69799/ha) as highest to medium size farms (Rs.70748/ha) and lowest in large size farms (Rs.69094/ha), respectively. This makes the sample average for farm investment income was Rs.

Table 3: Cost concepts in cabbage production in the study area **(Rs. per ha)**

Sr. No.	Cost concepts	Cabbage farm house hold			
		Small (n=27)	Medium (n=22)	Large (n=16)	Sample average (n=65)
1.	Cost A_1	31701	29652	30006	30453
2.	Cost A_2	35201	33152	33506	33953
3.	Cost B	39171	37102	37446	37906
4.	Cost C	44671	42002	41946	42873

Table 4: Measures of profitability in cabbage cultivation across different farms size in study area **(Rs. per ha)**

Sr. No.	Particulars	Cabbage farm household			
		Small (n=27)	Medium (n=22)	Large (n=16)	Sample average (n=65)
1.	Gross returns	110500.00	108800.00	107100.00	108800.00
2.	Farm business income	78799.00	75648.00	73594.00	76013.67
3.	Farm investment income	69799.00	70748.00	69094.00	69880.33
4.	Net returns	65829.00	66798.00	65154.00	65927.00
5.	Family labour income	71329.00	71698.00	69654.00	70893.67
6.	Input: Output ratio	1:2.47	1:2.59	1:2.55	1:2.53

65927/ha. Sample average of family labour income was Rs.70893.67/ha in different size of farms group (Hatai, 2007; Patil *et al.*, 2009 and Ravikumar, 2009).

Conclusion:

Cabbage is the major vegetable crop of Karnataka. The study was conducted in Kolar district with the objective to analyze the socio-economic characteristic of sample respondents, input requirement, cost and returns of the cabbage production. The results reveled that the socio-economic status of the respondents found to be moderate with primary education, well economic back ground and greater access to all the assets. Economics of cabbage production is more profitable in large farms as compared to medium size farms and small size farms. This will be the way for making cultivation more lucrative. A major constraint in production was found that high cost of labour and less awareness about new technologies among different farms size group.

Suggestions for policy implications:

Human labour, PPC chemicals and fertilizers were the major contributors to the Cabbage input. This indicates the importance of these inputs in cabbage production. Therefore, government need to timely supply of all these quality inputs to the cabbage growers will be helpful. The study revealed that, pest and diseases incidences are the dominant cause for the substantial reduction in production as well as productivity and profit margin of respondents. Although many alternative pesticides are available to control the pests and diseases but they are not cost effective. Hence, pest and disease resistance varieties may used as an alternative which could reduce the costs of PPC and save the farmer from particularly debt trap difficulty. Strengthening the extension system in popularizing improved seed, effective transfer of technology, frequent farmers training activities, seminars, etc to be needed for the cabbage growers. Establishing market intelligence on forecasting future demand and prices of the cabbage and there by minimize the risks of price fluctuation. Government should extend Crop Insurance facility for the cabbage crop. So that, the respondents can avail the facilities and minimize their risks in production.

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