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Documentation and Economic Analysis of Green Leafy Vegetables : A Study in Bengaluru District of Karnataka

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Abstract

The present study was carried out during 2019-20 at Bengaluru district. Bengaluru is located in South Eastern Karnataka, on the Deccan Plateau and it lies at an average elevation of 920 meters (3,018 feet) in the South Eastern part of Karnataka. The people of Bengaluru district mainly Urban and Rural population depend on green leafy vegetables as food supplements. This paper encompasses the information of 42 species of 42 genera of 31 families were tabulated as botanical name, local name, family and mode of consumption. Use of green leafy vegetables may act as alternative food resources other than cultivated vegetables, thus also acting as a multi-valued resource for health and wealth. The total sample size was 40 green leafy vegetable farmers/growers. Hence, an attempt was made to study the cost of cultivation, marketing costs and returns of growing green leafy vegetables. Results showed that, around 74.34 per cent of total cost of cultivation comprised of variable cost (Rs,12,003.11/acre) and fixed cost was 25.65 per cent (Rs.4,142.53/acre). The total cost of cultivation was Rs.16,145.64/acre, the net returns was Rs.45,932.61/acre and the magnitude of B:C ratio was 3.32:1. The marketing cost of green leafy vegetables in channel-II (produce – APMC – commission agent/traders – wholesalers – retailers – consumers) was Rs.269.76/1000 bundles, channel-II (producer – procurement centers – company retail outlets – consumers) was Rs.262.36/1000 bundles and in channel-III (producers – traders – wholesalers and retailers – consumers) was Rs.39.57/1000 bundles.

Keywords : Green leafy vegetables, Documentation, Bundles, Cost of cultivation, Marketing cost

Green leafy vegetables have played an important role in human life, since time immemorial. Millions of people do not have enough food to meet their daily requirements and are deficient in one or more nutrients and the similar situation is noticed in India with 70 per cent of rural population with rain fed agriculture dependent population. In India most urban and rural inhabitants depend on green leafy vegetables to meet their additional food requirements as they provide staple and supplement foods to urban and rural communities. The diversity in green leafy vegetables species offers variety in family diet and contributes to household food security. The nutritional value of green leafy vegetables is higher than several known common vegetables. India secured second position in the world next to china in vegetable production. However, this is much less than the recommended requirement of 300g/capita/day of vegetables for a balanced diet. Although, 175 major and minor vegetable crops are grown in India including 82 green leafy vegetables (Dey *et al.,* 2007). The World Health Organization (WHO) recommends a daily intake of more than 400g of green leafy vegetables per person to protect against diet related chronic diseases (Anonymous, 2004). Besides, green leafy vegetables are rich resource of carbohydrates, oils, proteins, minerals, ascorbic acid and the antioxidant phenols. Green leafy vegetables were largely transmitted through participation of individuals helps for future generation to obtain inexpensive food resource. Green leafy vegetables are largely ignored in land use planning and implementation, economic development and biodiversity conservation. Documentation of green leafy vegetables were limited compared to medicinal plants (Limo *et al.,* 2003).

India occupies a central position in rural life, with agriculture as its primary source of livelihood. The contribution of agriculture towards GDP is about 14

per cent in 2019-20 (MOSPI, 2019-20). Farming is the foundation of the Indian economy. Since agriculture is the backbone of the Indian economy, much more attention is needed to sustain agricultural industry. Development of allied agricultural sector, especially horticulture might be the best option for diverting resources from agriculture which ensures economic growth in large scale. A focused attention was adapted to horticulture development. Vegetable crops are of prime importance for nutritional needs of people. India has made tremendous progress in annual vegetable production of over 183.17 million tonnes and India is world's second largest producer of vegetables. The hybrid technology has revolutionized crop production of vegetables and continuously rising demand for hybrid seeds. The main advantages of hybrids are high production, short duration, superior quality, uniform production and resistance to biotic and abiotic stress.

Karnataka is India's seventh largest state, located in the tropical zone and enjoying warm climate year-round. The mean temperature ranges from 21.50 to 31.70 ^{0}C, the average state temperature is roughly 240 ^{0}C. The climatic condition is generally favourable for cultivating crops. Karnataka's geographical area is 190.50 lakh hectare of which an area of 121.82 lakh hectare is the cultivable area, making up 64 per cent of the geographical area. The normal state rainfall ranges between as low as 569 mm and as high as 4,029 mm. The average annual state rainfall is 1,354 mm. Most of the state's rainfall is provided from the South West monsoon, which begins the first week of June and lasts until the end of September. Almost all of the state contains red soils. Laterite soils tend to be found in the Western hilly and coastal areas. The Northern part of the state has black soils that have high potential for moisture.

Bengaluru lies at an average elevation of 920 meters (3,018 feet) in the South Eastern part of Karnataka. It is positioned at 12.97°N 77.56°E and covers an area of 2,190 km^2. Bengaluru has many lakes in it. Of these, the major is the Sankey lake, Ulsoor lake and Yediyur lake. Because of its elevation, Bengaluru enjoys a nice and unflappable environment across the year. The highest recorded temperature is 39 °C (102 °F) and the lowest temperature is 11 °C (52 °F). August, September and October are the wettest months; with a 180 mm is heaviest rainfall recorded in 24 hours period. Bengaluru is located in South Eastern Karnataka, on the Deccan Plateau. Bengaluru has an estimated 6.1 million metropolitan population making it the third-largest and fifth-largest metropolitan city in India. Ethno-botanical information was documented through semi structured questionnaires; Key informant interviews, frequent interactions and discussion with the local villager, farmers and retailers. The questions focused to be primarily on the local name of the plant, knowledge of the uses of plants in the past and present for consumption, collection and mode of food preparations.

Bengaluru was chosen as the study area to learn how green leafy vegetables are cultivated and marketed. Many retail companies come to Bengaluru to do business. Bengaluru has been chosen as the study location, as this city has been the center of the retail revolutions and has numerous food retail chains operating for a long time. Many new retail chains have also recently opened their stores in the city and several retail chains have made Bengaluru as the focal point of their managerial operations.

METHODOLOGY

In order to know regarding current cost of cultivation and marketing of green leafy vegetables in Bengaluru, the data was collected from 40 farmers belongs to different taluks of both Bengaluru Urban and Bengaluru Rural districts, were interviewed to know about quality of green leafy vegetables. To learn the optimum use of current resources and bottlenecks in cultivation and marketing of green leafy vegetables. The primary data forms an important component of any research investigation. The data pertaining to the source of seed materials, fertilizers, plant protection chemicals, finance, technology and information, etc., along with cultivation technology and marketing were collected from the farmers. Information pertaining to marketing channel, costs and financial sources was collected from market intermediaries such as commission agents, wholesalers and retailers, through

primary survey. Primary data was collected from 40 farmers, 20 retailers using a pre-structured questionnaire encompassing a number of variables which would help to arrive at the conclusions.

The present study was carried out with the following specific objectives they are;

1. To document the green leafy vegetables
2. To document the major green leafy vegetables marketed in Bengaluru
3. To assess the cost of cultivation and returns in green leafy vegetables by farmers
4. To assess the cost of marketing, margins and price spread of green leafy vegetables by farmers

Analytical tools and techniques employed are;

Depreciation :

$$\text{Annual depreciation} = \frac{\text{Purchase value} - \text{junk value}}{\text{Useful life of the asset}}$$

Gross returns: Gross returns (GR) = Yield *Price

Net returns: Net returns = Gross returns - Total costs

Price spread: The difference between retail price paid by the consumer and that received by the grower/ farmer for an equivalent quantity.

Results and Discussion

To Document the Green Leafy Vegetables

The study provides empirical evidence green leafy vegetables. The study area is floristically rich and includes various green leafy vegetables (Aberoumand, *et al.,* 2009). The present survey encompasses 42 green leafy vegetable species belonging to 31 family and 42 genera tabulated with botanical name, local name, family and mode of consumption of green leafy vegetables. (Table 1). The documentation on green leafy vegetables are tabulated (Arora and Pandey, 1996). More number of green leafy vegetables are documented they are amaranths, spinach, fenugreek, coriander, cabbage, cauliflower, moringa leaves, curry leaves, gongura leaves, mint leaves, lettuce leaves and dill etc.

To Document the Major Green Leafy Vegetables Marketed in Bengaluru

The documentation on major green leafy vegetables marketed in Bengaluru are tabulated in the Table 2. In Bengaluru major green leafy vegetables marketed are amaranths, spinach, fenugreek and coriander.

Cost and Returns of Cultivation from Selected Green Leafy Vegetables

The total cost of cultivation for all the green leafy vegetables was assessed by estimating per acre variable and fixed costs as shown in the Table 3. Among the different green leafy vegetable crops, the total variable cost incurred per acre in amaranths, coriander, dill, fenugreek and spinach crop cultivation was Rs.12,033.11/acre accounting 74.34 per cent (Gurikar, 2014).

The average cost of FYM was the highest *i.e.,* Rs.2105.26/acre with accounting for 13.03 per cent compared to other costs of materials. The average cost of green leafy vegetable seeds was Rs.1,609/ acre and accounts for 9.96 per cent, miscellaneous cost was around Rs.404.85/acre and its per cent is 2.50. Hence, the total material cost was about Rs.4,119.42/acre with 25.51 per cent. In machinery and labourers cost of ploughing and harrowing cost was Rs.1740.89/acre with 10.78 per cent and its cost was high as compared to other costs, then the loading and transportation of FYM costs about Rs.809.71/acre and its percentage is 5.01, the spreading of FYM was less cost that was Rs.485.82/acre with per cent 3.00 as compared to other costs and then the total labour cost was Rs.7,883.69/acre with 48.82 per cent, it was height cost as compared to the material cost of the green leafy vegetables.

Finally, the variable cost of green leafy vegetables was height *i.e*., Rs.12,033.11/acre with 74.34 per cent as compared to fixed cost was around Rs.4,142.53/acre with 25.65 per cent and the total cost of cultivation was Rs.16,145.64/acre. The analysis of gross returns for green leafy vegetable crops (Table 4) indicated

TABLE 1

Documentation on green leafy vegetables

Botanical name	Family	Common name	Local name	Mode of consumption
Achyranthes aspera L.	Amaranthaceae	Prickly chaff flower	Uttarani	Young leaves and shoots are collected, roasted then eaten.
Allium cepa L.	Amaryllidaceae	Onion leaves	Eerulli soppu	Young leaves are mixed with flour of Ragi or rice to prepare rotti.
Allmania nodiflora	Amaranthaceae	Node flower	Hasirubudde soppu	Leaves are cooked as vegetable
Anethum graveolens	Apaiaceae	sabbasige	sabbasige soppu	Leaves are cooked as vegetable
Amaranths blitum L.	Amaranthaceae	Purple amaranths	Chilakarive	Leaves and young shoots is used to prepare curry and leaves are also used to prepare palyam
Amaranths caudatus L.	Amaranthaceae	Foxtail amaranths	Chilike soppu	Leaves and young shoots is used to prepare curry and leaves are also used to prepare palyam
Amaranths cruentus L.	Amaranthaceae	Red amaranths	Rajagiri	Leaves and young shoots is used to prepare curry and leaves are also used to prepare palyam
Amaranths dubius L.	Amaranthaceae	-	Mulladantu	Leaves and young shoots is used to prepare curry and leaves are also used to prepare palyam
Amaranths gangeticus L.	Amaranthaceae	Amaranths	Dantu soppu	Leaves and young shoots is used to prepare curry and leaves are also used to prepare palyam
Amaranths polygonoides L.	Amaranthaceae	Amaranths	Chikkire soppu	Leaves and young shoots is used to prepare curry and leaves are also used to prepare palyam
Amaranths roxburghianus L.	Amaranthaceae	Amaranths	-	Leaves and young shoots is used to prepare curry and leaves are also used to prepare palyam
Amaranths spinosus L.	Amaranthaceae	Amaranths	Mullu harave soppu	Leaves and young shoots are cut into small pieces, cooked with salt and chilly and then eaten.
Amaranths tricolor L.	Amaranthaceae	Jacob's coat	Dantina soppu	Leaves and young shoots is used to prepare curry and leaves are also used to prepare palyam
Amaranths viridis L.	Amaranthaceae	Green amaranths	Nayi harive soppu	Leaves and young shoots is used to prepare curry and leaves are also used to prepare palyam
Basella alba L.	Basellaceae	Indian spinach	Basale soppu	Stem and leaves are used to prepare curry.
Beta vulgaris var. Bengalensis L.	Chenopodiacee	Palak	Palak soppu	Young leaves are boiled in water and mixed with flour of Ragi to prepare rotti.

Botanical name	Family	Common name	Local name	Mode of consumption
Boerhavia diffusa L.	Nyctaginaceae	Horse purslane	Odakalu soppu	Tender leaves and young shoots are collected, fried/ roasted then eaten.
Brassica juncea (L) Czern. & Coss.	Brassicaceae	Indian mustard.	Sasive soppu	Yung leaves are used to prepare curry
Cardiospermum helicacabum L.	Sapindaceae	Baloon vine	Agnibali	Cooked as vegetable
Cassia fistula	Fabaceae	Golden shower	Kakke soppu	Cooked as vegetable
Celosia argentea L.	Portulaceae	Red spinach	Anne soppu	Young leaves and shoots are collected, roasted then eaten.
Centella asiatica (L.) Urban	Apiaceae	Indian pennywort	Ondelga soppu	Leaves and young shoots are collected, roasted then eaten.
Chenopodium album L.	Chenopodiaceae	Chenopod	Sakothina soppu	Cooked as vegetable
Cleome gynandra L.	Cleomaceae	African cabbage	Kadu sasive	Leaves and young shoots are collected, roasted then eaten.
Cleome viscosa L.	Cleomaceae	Yellow spider flower	Nayibela	Leaves and young shoots are collected, fried/ roasted then eaten.
Commelina communis L.	Commelinaceae	Asiatic day flower	Kanne soppu	Cooked as vegetable
Coriandrum sativum	Apaiaceae	dhanya	Kothamberi soppu	Cooked as vegetable
Digera muricata L.	Amaranthaceae	False amaranths	Chenchali soppu	Cooked as vegetable
Eclipta alba L.	Asteraceae	Bhringaraj	Garuga Soppu	Cooked as vegetable
Lathyrus sativus L.	Papilionaceae	Lathyrus	Kesari	Cooked as vegetable
Merremia emarginata (Burm. f) Hallier f	Convolvulaceae	Kidney Leaf Morning Glory	-	Cooked as vegetable
Moringa oleifera L.	Moringaceae	Drumstick	Nugge soppu	Leaves are eaten after frying or roasting.
Oxalis corniculata L.	Oxalidaceae	Indian Sorrel	Huli soppu	Leaves are plucked, and Eaten as raw.
Phyllanthus amarus L.	Euphorpiaceae	Carry Me Seed	Nela nelli	Eaten as raw
Portulaca oleracea L.	Portulaceae	Purslane	Nelabasale soppu	Cooked as vegetable
Portulaca quadrifida L.	Portulaceae	Chicken leaf	Goni soppu	Tender leaves and shoots are collected, roasted then eaten.
Raphanus sativus L.	Brassicaceae	Radish	Mulangi soppu	Cooked as vegetable
Sesbania grandiflora (L.) Pers.	Fabaceae,	West Indian Pea	Agase soppu	Cooked as vegetable
Spinacia oleracea	Amaranthaceae	Pinni Palak	Palak soppu	Cooked as vegetable
Solanum nigrum L.	Solanaceae	Black nightshade	Kachi soppu	Cooked as vegetable
Trianthema portucastrum L.	Aizoaceae	Desert horse purslane	Sambar soppu	Cooked as vegetable
Trigonella foenumgraecum L.	Apaiaceae	Methi	Menthya soppu	Fresh leaves used for pulav preparations

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TABLE 2

Documentation on major green leafy vegetables marketed in Bengaluru district

Botanical name	Family	Common name	Local name	Mode of consumption
Amaranths gangeticus L.	Amaranthaceae	Amaranths	Dantu soppu	Leaves and young shoots is used to prepare curry and leaves are also used to prepare palya
Spinaciaoleracea	Amaranthaceae	Pinni Palak	Palak soppu	Cooked as vegetable
Trigonella foenum graecum L.	Apaiaceae	Methi	Menthya soppu	Fresh leaves used for pulav preparations
Coriandrumsativum	Apaiaceae	dhanya	Kothamberi soppu	Cooked as vegetable

TABLE 3

Cost of cultivation of green leafy vegetables

(Rs./acre)

Particulars	Costs	Percentage
A. **Variable costs**		
1. *Material costs*		
a. FYM and fertilizers	2,105.26	13.03
b. Seeds	1,609.31	9.96
c. Miscellaneous	404.85	2.50
Total material costs (A)	4,119.42	25.51
2. *Labour and machinery costs*		
a. Ploughing & harrowing	1,740.89	10.78
b. Loading & transportation of FYM	809.71	5.01
c. Spreading of FYM	485.82	3.00
d. Sowing	623.48	3.86
e. Fertilizer application	1,170.04	7.24
f. Irrigation	506.07	3.13
g. Weeding	728.74	4.51
h. Harvesting	971.65	6.01
3. *Marketing expenses*	728.74	4.51
4. *Interest on working capital @ 4 %*	118.55	0.73
Total labor costs (2+3+4)	7,883.69	48.82
Total variable costs (1+2+3+4)	12,003.11	74.34
B. **Fixed costs**		
a. Land revenue	45.00	0.27
b. Maintenance of farm equipment's	2,186.23	13.54
c. Depreciation	89.44	0.55
d. Rental value of land	1,821.86	11.28
Total fixed cost (B)	4,142.53	25.65
Total cost of cultivation (A+B) (Avg. of 40 farmers)	**16,145.64**	**100.00**

Note : 1+2+3+4= variable costs / paid out costs

Table 4

Cost and returns of green leafy vegetables production

Particulars	Green leafy vegetables
Avg. total cost of cultivation/ha (Rs.)	16,145.64
Avg. yield of good quality leaves (Bundles/acre)	12,415.65 (3.33/bundle)
Gross returns (Rs./acre)	62,078.25
Net returns (Rs./acre)	45,932.61
B:C ratio	3.32:1

that the gross returns obtained per acre was Rs.62,078.25 based on per acre yield of good quality marketable leaves. With respect to net returns, it was Rs.45,932.61/acre (Jaffer and Namasivayam, 2005).

Thus, cultivation of green leafy vegetables in the study area was found to be profitable as revealed by the net returns. The analysis of returns and cost were used to compute the benefit cost ratio and it resulted into a profitable benefit cost ratio in respect of all the green leafy vegetables. The magnitude of B:C ratio was 3.32:1 there by indicated higher returns for every rupee invested in the green leafy vegetables production in the study area (Kaur Harshimranjeet and Singh, 2007).

Cost of Marketing, Margins and Price Spread of Selected Green Leafy Vegetables

The major marketing channels identified in the study area adopted by the respondents, are given below.

Channel-I: Producer – APMC – Commission agent / trader – Wholesalers – Retailers – Consumers

Channel-II: Producer – Procurement centers – Company retail outlets - Consumers

Channel-III: (On farm sales) Producer – Traders - Wholesaler and Retailer – Consumers

The marketing costs involved in the marketing of selected green leafy vegetables was presented in the Table 5. The total marketing cost in channel-I was Rs.269.76/1000 bundles and here marketing takes place from producer to APMC market next sells to commission agent / traders next sells to wholesalers next sells to retailers next sells to consumers and marketing cost was more in this channel. The total marketing cost in channel-II was Rs.262.36/1000 bundles and here the marketing takes place from producer to procurement centers next sells to company retail outlets next sells to consumers. The total marketing cost in channel-III was Rs.39.57/1000 bundles and here the marketing cost was low because the traders will only take the produce from farm itself and next sells to wholesalers and retailers and finally sells to consumers (Thorat and Bhujbal, 2010).

TABLE 5

Cost of marketing of green leafy vegetables

(Rs./1000 bundles)

Particulars	Channel-I	Channel-II	Channel-III
Assembling/preparing	40.32	40.41	39.57
Packing	81.56	80.06	-
Loading/uploading	27.01	30.01	-
Transport	50.97	50.97	-
Tax/market fee	45.81	-	-
Spoilage loss etc.	8.62	20.91	-
Others	15.47	40.00	-
Total marketing cost	269.76	262.36	39.57
Farmer selling price	5,000.00	8,000.00	5,000.00
APMC selling price	6,000.00	-	-
Procurement centers selling price	-	10,000.00	-
Commission agent / trader selling price	8,000.00	-	8,000.00
Wholesalers selling price	10,000.00	-	10,000.00
Retailers selling price	12,000.00	14,000.00	10,000.00
Consumer purchase price	12,000.00	14,000.00	10,000.00
Price spread	7,000.00	6,000.00	5,000.00

Note:

Channel-I : Producer – APMC – Commission agent / trader – Wholesalers – Retailers - Consumers

Channel-II : Producer – Procurement centers – Company retail outlets – Consumers

Channel-III: (On farm sales) Producer – Traders - Wholesaler and Retailer –Consumers

The marketing costs and margin in channel-I adopted in the distribution of green leafy vegetables showed the producers selling price was Rs.5,000/1000 bundles and the ultimate price paid by the consumer was Rs.15,000/1000 bundles. It was found that farmer as a producer played a limited role as marketer and his role was only to the extent of preparing and sells the produce to APMC market. In this channel, there was an intervention of middlemen in the marketing of green leafy vegetables. Hence, the price spread in this channel-I was Rs.7,000/1000 bundles.

The marketing costs and margin in channel-II adopted in the marketing of green leafy vegetables showed that the producers' selling price was Rs.8,000/1000 bundles and the ultimate price paid by the consumer was [1]Rs.14,000/1000 bundles. It was found that farmer as a producer played a limited role as marketer and his role was only to the extent of preparing the produce and sells to the procurement centers. In this channel, there was an intervention of middlemen in the marketing of green leafy vegetables. Hence, the price spread in this channel-II was [1]Rs.6,000/1000 bundles.

The marketing costs and margin in channel-III adopted in the marketing of green leafy vegetables showed that the producers' selling price was Rs.5,000/1000 bundles and the ultimate price paid by the consumer was Rs.10,000/1000 bundles. It was found that farmer as a producer played a limited role as marketer and his role was only to the extent of preparing the produce for the traders. In this channel, there was an intervention of middlemen in the marketing of green leafy vegetables. Hence, the price spread in this channel-III was Rs.5,000/1000 bundles and in this channel less price spread is observed, respectively.

Hence, by accounting the marketing cost incurred by producer in channel-I he actually received a net price of Rs.5000/1000 bundles. The share in price spread by APMC comprising the cost incurred profit margin was Rs.1000/1000 bundles and commission agent / traders, wholesalers and retailers comprising the cost incurred profit margin was Rs.2,000/1000 bundles from each one. In channel-a! the producer share in price spread by procurement centers comprising the cost incurred profit margin was Rs.2000/1000 bundles and company retail outlets comprising the cost incurred profit margin was Rs.4000/1000 bundles. In channel-III the producer share in price spread by traders comprising the cost incurred profit margin was Rs.3000/1000 bundles and wholesalers and retailers comprising the cost incurred profit margin was Rs.2000/1000 bundles. From the above analysis, it was observed that the retailers of green leafy vegetables added more price to the consumers' price when compared to the others in marketing of green leafy vegetables.

The people of Bengaluru district have rich knowledge on use of green leafy vegetables. Uses of green leafy vegetables provide seasonal, staple foods and important alternative to the agriculturally cultivated crops. The study revealed that the distribution and importance of green leafy vegetables utilization in the past and present in Bengaluru district. It shows that green leafy vegetables use is influenced by culture and socio-economic conditions. Many valuable green leafy vegetables are familiar to certain areas or to certain communities but are unknown to others. Green leafy vegetables are not only sources of food and nutrients to the local communities, but could also be means of income generation and managed sustainably. Several green leafy vegetables can benefit local people not only as food, but also with their medicinal properties. These multi-valued resources are threatened by several anthropogenic and natural causes such as land-use change, unscientific harvesting, over-grazing, and invasive species. Therefore, sustainable management of these resources for the wellbeing of the local and urban communities as well as to conserve biodiversity is of the at most importance and could also contribute to preserve cultural and genetic diversity.

Green leafy vegetables were grown by the farmers in study area with an anticipation of good profits due to higher yields in short duration and its volatility in prices. Thus, the different green leafy vegetable crops the average cost of cultivation was Rs.16,145.64/acre in that the variable cost was Rs. 12,033.11/acre accounting 74.34 per cent and fixed cost was Rs.4,142.53/acre accounting 25.65 per cent, respectively. The magnitude of B:C ratio was 3.32:1 there by indicated higher returns for every rupee invested in green leafy vegetable cultivation in study area. The average marketing cost of green leafy vegetables like amaranths, fenugreek, spinach, coriander and dill was Rs.269.76/1000 bundles and for channel-I, in channel-II the marketing cost was Rs.262.36/1000 bundles and in channel-III the marketing cost was Rs.39.57/1000 bundles, respectively. In this study the retailers of green leafy vegetables added more price to the consumers' price when compared to the others in marketing of green leafy vegetables.

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