Journal of Pharmacognosy and Phytochemistry
Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; Sp 9(5): 807-810
Received: 08-09-2020
Accepted: 15-10-2020

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An economic analysis of production and marketing of ginger in Bidar district of Karnataka

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Abstract
The present study entitled "An economic analysis of production and marketing of ginger in Bidar district of Karnataka" was conducted in the year 2019-2020. The study made use of a multi stage sampling and random sampling technique to select 120 farmers among the selected villages. Data for the selected study were collected with the aid of well-structured questionnaires. Data collected were analyzed using tabular methods along with required statistical tools. The production of ginger has increased in the area largely due to productivity increase and increase in the area under crop. Resource use structure in ginger was found to be varied among the size groups. The per cost of cultivation was varied among the size groups of ginger were highest in marginal (Rs.57277.5/ha) and lowest in medium (Rs.54659/ha) and small (Rs.55703.4/ha). The input output ratio is highest on Medium size farms and lowest on marginal size farms.

Keywords: Ginger, cost and return, input output ratio, Bidar

Introduction
India is rightly called as "spice bowl of the world" for its production of variety and superior quality spices. Growing of spices for various purposes has been famous since the ancient times. There are records about its various properties in Vedas as early as 6000 BC. India is known for trade since the exploration of sea routes. All these attracted the foreigners to India and this was the key reason why India invaded by European countries and was imperialized. To such an extent India was famous for the spices. According to the Bureau of Indian Standards (BIS), 63 spices are grown in India. The spices are grown throughout the country from tropical to temperate climate. India has highest number of spice varieties in the world.
Ginger is been used in many different products. Ginger tea has been used as a carminative and for the treatment of cold since many centuries. It has been used in China as a tonic. The Greeks, after a large meal, used to wrap bread around a piece of ginger and eat it to ease indigestion. In England, ginger was added to beer, forerunner to ginger ale, as a remedy for diarrhea, nausea and vomiting. The Chinese also considered ginger root to be an antidote to shellfish poisoning, explaining why it is found in so many sea fooddishes. Ginger is popular because of its pungent flavour. It is a complement to many meals, drinks and desserts. Due to its popularity and diverse scope for product development it has advantageous for the local communities of Nepal to value add their products. This assisted in gaining a higher profit margin for the local producers and product variety for consumers in local markets and in Kathmandu. It lessen the gap between products produced in Nepal and those imported from overseas and be an import replacing Nepal made product. With an appeal for ginger-based preparations, ginger oil etc, is also encouraged. It is very useful for cold induced diseases, like nausea, asthma, cough, heart palpitation, syperia and home remedy in the country since 2000 years back. These added medicinal values besides taste-maker need to be popularized, supported with clinical tests having scientific evidences. Ginger contains 2-3 per cent protein, 0.9 per cent fat, 1.2 per cent minerals, 2.4 percent fiber, 12.3 per cent carbohydrate and a good source of calcium, phosphorous, iron and vitamins. The pungency of ginger has all the constituents, which are needed for good health and improving the quality of food.

Research Methodology
The study was conducted in Bidar district of Karnataka. Bidar district contains Five blocks were selected viz Bhalki, Humanabad, Bidar, Aurad, Basavakalyana. Among all these blocks, Humnabad blocks were selected for the study. A list of 7 villages were selected randomly out of them. A list of all ginger farmers/respondents is prepared with the help of head of the villages pradhan or head of each selected villages in the block, there after farmers/respondents is categorized into categories on the basis of their land holding and then from each village 10% farmers were selected randomly from all the different size of farm groups.

Data for the study was collected from all 120 farmers randomly I.e., 58 marginal farmers, 42 small farmers, 20 medium farmers. Tabulation method is used for analysis of data along with required statistical tools for the interpretation of the results.

Results and Discussions

The study was conducted in Bidar district of Karnataka. The necessary data were collected from the sample farmers spread over oneblocks in the above mentioned district. The present chapter is going to talk about the results and discussion for various objectives. The chapter is arranged in different sub-section according to objectives of the study.

- To study cost and return per hectare and input output ratio of different size of farm groups.

Resource use and Cost of cultivation of ginger per hectare in different size of farm groups

The economic aspects of ginger such as cost of cultivation, returns per hectare, input and output ratio of marginal size, small and medium size farm groups are given below

Table 1: Resource use and Cost of cultivation of ginger per hectare in different size of farm groups

Sl. No	Particulars of Farm Operations	Size of Farms Groups			Sample Average
		Marginal	Small	Medium	
1	Hired Human Labour Charges	8100.00 (3.86)	8460.00 (4.20)	8820.00 (4.51)	8346.00 (4.08)
2	Bullock Labour Charges	3850.00 (1.84)	3500.00 (1.74)	3150.00 (1.61)	3610.83 (1.77)
3	Machinery Labour Charges	3600.00 (1.72)	4200.00 (2.80)	4200.00 (2.15)	3910.00 (1.91)
4	Cost of Seedlings	87500.00 (41.71)	85000.00 (42.17)	82000.00 (41.93)	85708.33 (41.90)
5	Cost of Farm Yard Manure	15000.00 (7.15)	14500.00 (7.19)	14000.00 (7.16)	14658.33 (7.17)
6	Cost of chemical Fertilizers	14000.00 (6.61)	13100.00 (6.50)	12650.00 (6.47)	13460.00 (6.58)
7	Cost of Irrigation charges	20000.00 (9.53)	18000.00 (8.92)	18000.00 (9.20)	18966.67 (9.27)
8	Cost of Plant Protection charges	8000.00 (3.81)	7700.00 (3.82)	7500.00 (3.83)	7811.67 (3.82)
9	Miscellaneous charges	2500.00 (1.19)	2200.00 (1.09)	2100.00 (1.07)	2328.33 (1.14)
10	Interest on Working Capital @ 8%	13004.00 (6.20)	12532.8 (6.22)	12193.60 (6.23)	12704.01 (6.21)
11	Deprecation on Fixed Resources	5000.00 (2.38)	4800.00 (2.38)	4500.00 (2.30)	4846.67 (2.37)
12	Land Revenue Paid to Government	200.00 (0.10)	200.00 (0.10)	200.00 (0.10)	200.00 (0.10)
13	Interest on Fixed Capital @ 10%	1720.00 (0.82)	1700.00 (0.84)	1670.00 (0.85)	1704.67 (0.83)
14	Rental Value of Own Land	12000.00 (5.72)	12000.00 (5.95)	12000.00 (6.14)	12000.00 (5.87)
15	Imputed value of Family Labour charges	15300.00 (7.29)	13680.00 (6.79)	12600.00 (6.44)	14283.00 (6.98)
16	Total Cost of Cultivation	209774.00 (100.00)	201572.80 (100.00)	195584.00 (100.00)	204538.51 (100.00)

The Table no.1 revealed that among different size of farms, total cost incurred by the marginal size farms were high (Rs.209774.00/ha) as compared to small and medium size farms (Rs.201572.80/ha and Rs.195584.00/ha). Sample average for total cost was Rs.204538.51/ha in different size of farms group.

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 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 medium size farms (Rs.8820/ha), compared to small size farms (Rs.8460/ha) and lowest on marginal size farm (Rs.8100/ha). Whereas, bullock labour cost was the highest in case of marginal size farms (Rs. 3850/ha) as compared to small (Rs. 3500/ha) and medium farms (Rs. 3150/ha).

Machinery labour cost was Rs. 3910/ha in different size of farms group. The cost of seedlings was the highest on marginal size farms (Rs.87500/ha) and lowest in medium size farms (Rs.82000/ha) respectively. As Ginger would respond well with chemical fertilizer so the cost of farm yard manure used was ranged from Rs. 15000 (marginal size farms) to 14000 (medium size farms). Whereas, the expenditure on fertilizers was the highest (Rs.14000/ha) for marginal size farms as compared to small size farms (Rs.13100/ha) and medium size farms (Rs.12650/ha) respectively. It was also noticed that the highest expenditure on pesticide was seen on marginal size farms (Rs.8000/ha) as compared to small and medium size farms respectively. Sample average for depreciation on fixed resources was Rs.4846.67, interest on working capital Rs.12704.01, interest on fixed capital was Rs.1704.67. Land revenue paid to government was Rs.200 in different size of farms group.

The cost of rental value of own land was Rs.12000/ha in different size of farms group. Sample average for rental value of own land was Rs 12000/ha.

ANOVA for resource use and cost of cultivation for Ginger crop in different size of farm

Source	Df	S.S	MSS	F. Cal	F. Tab @5%	Result	S.Ed	C.D @ 5%
Size of groups	2	6766614.45	3383307.225	5.375795	3.3403856	S	647.7445	1305.443
Particular	14	17661013485	1261500963	2004.4206	2.0635408	S	289.68015	583.812
Error	28	17622063.63	629359.4154	–	–	–	–	–
Total	44	–	–	–	–	–	–	–

In the above ANOVA table, in due to size group degree of freedom is 2,sum of squares is 6766614.45, mean sum of squares is 3383307.225, F. calculated value is 5.375795, F.tabulated value @ 5%is 3.3403, result is significant, standard deviation is 647.7445 and critical difference @5%is 3.3403, In due to particulars degrees of freedom is 14, sum of squares is 17661013485,mean sum of squares is 1261500963, F.calculated value is 2004.4206, F.tabulated value is 2.06354, result is significant, standard deviation is 289.68015 and critical difference @ 5% is 583.812, In error degrees of freedom is 28, sum of squares is 17622063.63 and mean sum of squares is 629359.4154.

Table 2: Costs and Returns in Ginger crop per hectare in different Size of Farms Group

Sl. No	Particulars	Size of Farms Group			Sample Average
		Marginal	Small	Medium	
1	Total Cost of cultivation	209774	201573	197564	204868.58
2	Yield in tons per hectare	190	193	198	192.38
3	Gross Returns per hectare in rupees	608000	617600	633600	615626.67
4	Net Returns per hectare	398226	416027	436036	410758.09
5	Cost of Production per quintal	1104.07	1044.42	997.80	1065.48
6	Price Per quintal	3200.00	3200.00	3200.00	3200.00
7	Input-Output ratio	1:2.90	1:3.06	1:3.21	1:3.01

Table 2 reveals that Costs and Returns in Ginger cultivation in different size of farms group. Among different size of farms groups, the total cost of cultivation incurred by the marginal farms were high (Rs.209774/ha) as compared to small (Rs.201573/ha) and medium farms (Rs.197564/ha).

Sample average for total cost of cultivation was Rs.204868/ha in different size of farms group. The gross returns obtained per hectare by medium size farms were high (Rs. 633600/ha) as compare to small and marginal size farms (Rs.617600/ha and Rs.608000/ha) respectively. The net returns per hectare obtained by medium size farms were high (Rs.436036/ha) as compared to small and marginal size farms (Rs.416027/ha and Rs.398226/ha) respectively.

The average yield of Ginger in different size of farms group was Rs.192.38/ha. The yield was highest in case of medium size farms 198 qtl/ha as compared to small (193 qtl/ha) and marginal size farms (190 qtl/ha) respectively. Average cost of production per qtl was Rs. 1065/qtl. Gross Price per quintal was Rs.3200/qtl.

ANOVA for cost and returns in ginger crop in different size of farm

Source	df	S.S	MSS	F. Cal	F. Tab @5%	Result	S.Ed	C.D @5%
Size of groups	2	19674151.36	9837075.679	1.021107027	5.14325285	NS	2534.263358	5577.876
Particular	3	91359960079	30453320026	3161.11211	4.757062664	S	2194.736448	4830.58
Error	6	57802416.93	9633736.155	–	–	–	–	–
Total	11	–	–	–	–	–	–	–

In the above ANOVA table, in due to size group degree of freedom is 2, sum of square is 19674151.36,mean sum of squares is 9837075.679,F.calculated value is 1.0211070, F.tabulated value @ 5% is 5.1432, result is non-significant, standard deviation is 2534.26335 and critical difference is @ 5% is 5577.876. In due to particular, degree of freedom is 3, sum of squares is 91359960079, mean sum of squares is 30453320026, F.calculated value is 3161.11211, F.tabulated value @ 5% is 4.75706, result is significant, standard deviation is 2194.736448 and critical difference @ 5% is 4830.58. In error, degree of freedom is 6, sum of squares is 57802416.93 and mean sum of squares is 9633736.155

Table 3: Cost Concepts in Ginger crop per hectare in different Size of Farms Group

Sl. No	Cost Concepts	Size of Farms Group			Sample Average
		Marginal	Small	Medium	
1	Cost A_1	180754.00	174192.80	169313.60	176550.80
2	Cost A_2	180754.00	174192.80	169313.60	176550.80
3	Cost B	194474.00	187892.80	182983.60	190255.50
4	Cost C	209774.00	201572.80	195583.60	204538.50

Table 3 reveals that Cost Concepts on different size of farms group per hectare. Cost A_1 was highest in marginal size farms (Rs.180754/ha) followed by small size farms (Rs.174192/ha) and lowest in medium size farms (Rs.169313/ha) respectively. Cost A_2 in marginal, small and medium size of farms groups was Rs.180754/ha, Rs.174192/ha and Rs.169313/ha respectively. Cost B was highest in marginal size farms (Rs.194474/ha) as compared to small size farms (Rs.187892/ha) and lowest in medium size of farms (Rs.182983/ha) respectively. Cost C was highest in marginal size farms (Rs.209774/ha) and lowest in medium size farms (Rs.195583/ha). Sample average for Cost A_2, Cost B and Cost C was Rs.176550/ha, Rs.190255/ha and Rs.204538/ha in different size of farms group.

Table 4: Measures of Farm Profitability in Ginger crop per hectare in different Size of Farms Group

Sl. No	Particulars	Size of Farms group			Sample Average
		Marginal	Small	Medium	
1	Gross Returns	608000.00	617600.00	633600.00	615626.67
2	Farm Business Income	427246.00	443407.20	464286.00	439075.82
3	Farm Investment Income	411946.00	429727.20	449706.00	424462.75
4	Net Returns	398226.00	416027.20	438016.00	411088.15
5	Family Labour Income	413526.00	429707.20	450616.00	425371.15

Table 4 reveals that Measures of Profitability in Ginger cultivation in different size of farms group. The gross returns obtained per hectare by medium size farms were high (Rs. 633600/ha) as compare to small and marginal size farms (Rs.617600/ha and Rs.608000 /ha) respectively. This makes the sample average for gross returns was 615626/ha in different size of farms group. Farm business income in marginal, small and medium size of farms group was

Rs.427246/ha, Rs.443407.20/ha and Rs.464286.00/ha respectively. Sample average for farm business income was 439075.82/ha in different size of farms group. Farm investment income was highest in medium size farms (Rs.449706/ha) as compared to small size farms (Rs.429727/ha) and lowest in marginal size farms (Rs.411946/ha) respectively. This makes the sample average for Farm investment income was Rs.424462.75/ha in different size of farms group. The net returns per hectare obtained by medium size farms were high (Rs.438016/ha) as compared to small and marginal size farms (Rs.416027.20/ha and Rs.398226/ha) respectively. Sample average of net returns was 411088.15/ha in different size of farms group. Sample average of Family labour income was Rs. 425371.15/ha in different size of farms group.

ANOVA for cost and returns in Ginger crop in different size of farm group

Source	Df	S.S	MSS	F. Cal	F. Tab @ 5%	Result	S.Ed	C.D @5%
Size of groups	2	3159292862.80563	1579646431.40268	195.25491	4.4589701	S	2322.3803	4981.01
Particular	4	86596076691.904	21649019172.976	2675.9642	3.8378534	S	1798.908	3858.27
Error	8	64721402.37	8090175.296	–	–	–	–	–
Total	14	–	–	–	–	–	–	–

In the above ANOVA table, in due to size group degrees of freedom is 2, sum of square is 3159292862, mean sum of squares is 1579646431.40268, F.calculated value is 195.25491, F.tabulated value @ 5% is 4.4589701, result is significant, standard deviation is 2322.3803 and critical difference is @ 5% is 4981.01. In due to particular, degree of freedom is 4, sum of squares is 86596076691.904, mean sum of squares is 21649019172.976, F.calculated value is 2675.9642, F.tabulated value @ 5% is 3.8378534, result is significant, standard deviation is 1798.908 and critical difference @5% is 3858.27. In error, degree of freedom is 8, sum of squares is 64721402.37 and mean sum of squares is 8090175.296.

Conclusion

The production of ginger has increased largely due to productivity increase and increase in the area under the crop.the acreages under ginger were not influenced by improvement in productivity but it largely depended on the other factors like rainfall and price of this crop. Resource use structure in ginger was found to be varied among the size groups. Production cost of ginger was varied according to size groups of holding. The per hectare cost of cultivation of ginger was the highest on marginal size farms and lowest on medium size farms. Among which rental value of land, hired human labour, fertilizers, manures, seeds were the major items of cost. The cost of cultivation varied among the size groups of ginger growers.

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