STUDY ON ECONOMICS AND MARKETING PATTERN OF GINGER CULTIVATION IN WOKHA DISTRICT OF NAGALAND, INDIA

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ABSTRACT

For the study 60 ginger growers were identified following multistage stratified random sampling. From the study it was revealed that, the average per hectare total cost of ginger cultivation was Rs. 8,50,386.43. Planting material/rhizomes with 31.60 percent constituted the highest cost expenses, followed by hired human labour 19.10, FYM & plant protection 11.85, family labour 8.32, marketing cost 6.47, and transportation expenses 4.63. The production cost per ha increases with increase in farm sizes. The average ginger yield for all farmer groups was found to be 32.5q with gross income of Rs. 38, 49,693.33. The highest gross income falls under medium group and marginal as lowest. The average net returns found out for all farmer groups was Rs. 30,73,326.90 with highest from medium group (Rs. 64,54,570.00) and the lowest in marginal group (Rs. 3,44,555). As per findings the net income increased with increase in farm sizes. The Benefit Cost Ratio (BCR) average was 4.2. Two marketing channels were identified from the research study two blocks namely: Producer-Consumer (Channel I) and Producer-Wholesaler-Consumer (Channel II). About 3035.27q (85.13 percent) were sold through channel II which dominated the marketing channel. As per findings, Channel I was efficient for marginal farmers and Channel - II for medium and small farmer groups.

KEYWORDS: *Wokha, Nagaland, Economics, Ginger, Marketing Channel, Margin*

INTRODUCTION

Ginger (*Zingier officinal* Rocs.) is an important commercial crop grown for its aromatic rhizomes which is used both as spice and medicine. It is an herbaceous perennial belonging to Zingiberaceae, and is believed to be the native of south-eastern Asia. It is marketed in different forms such as raw ginger, dry ginger, bleached dry ginger, ginger powder, ginger oil, ginger oleoresin, ginger ale, ginger candy, ginger beer, brined ginger, ginger wine, ginger squash, ginger flakes, etc.

The North Eastern Region has a good potential on varieties of spices like chillies, ginger, turmeric, large cardamoms, black pepper, tejpatta, etc. Ginger and turmeric are prominent spice crops cultivated in this region as a cash crop mostly in jhum fields. Ginger is grown in almost all the states of the region with major shares but from Meghalaya, Mizoram, Arunachal Pradesh and Sikkim. Generally varieties like Nadia, China, Varada, etc. are extensively cultivated in north eastern region. These varieties are high yielder of rhizomes. The ginger generally contains high oleoresin and oil (Hazarika and Merilin Kakoti. 2013). The region as a whole produces over 207 thousand tonnes of raw ginger every year. About 70–80 % of the total production is

reportedly available as marketable surplus from the region. Though ginger has a good pungency, it losses over time. The post harvest loss is estimated to be about 10.5 percent during handling and transportation. North eastern states lack post harvest technology despite abundantly available in the region. Export is generally in freshly harvested form. Therefore, given the fact that there is an immense scope and prospective, the study was conducted to know the present scenario of economics and marketing pattern of ginger cultivation in Wokha district of Nagaland with the following objectives.

OBJECTIVES

To study the economics and marketing pattern of ginger cultivation in Wokha district of Nagaland.

MATERIALS AND METHODS

The research study was conducted in Wokha district of Nagaland. Wokha district is situated at latitude 26° 8N and longitude 94° 18E. The study on economics of banana cultivation was carried out in Wokha district of Nagaland, India. Wokha district of Nagaland has five Sub-Divisions/Blocks. The study was conducted in tow R.D blocks viz. Wokha and Chukitong under Wokha district of Nagaland. A sample of 60 ginger growers was selected following multi stage stratified random sampling technique. The randomly selected 60 respondents from the four villages were categorized into three groups basing on their holdings for the research study which were given as below.

The Cost of Cultivation of Ginger Was Estimated With The Help of Cost Concept Used in Farm Management Studies Which Were Discussed as Under:

- Cost A_1= It includes hired human labour + seed cost + marketing charges + transportation cost and depreciation + interest on working capital.
- Cost B_1= Cost A_1 + interest on fixed capital excluding land.
- Cost B_2= Cost B_1 + Rental value of owned land.
- Cost C_1= Cost B_1+ imputed value of family labour.
- Cost C_2= Cost B_2+ imputed value of family labour.
- Farm business income= Gross return – CostA_1.
- Family labour income = Gross return – CostB_2.
- Net income = Gross return – Cost C_3.

Table 1

Group	Land holding size (ha)	No. of selected farmers
Marginal	Less than 1.00	8
Small	1.01-2.00	21
Medium	2.01 and above	31
Total		**60**

Benefit Cost Ratio:

- Benefit cost ratio on variable cost= Gross income / Variable cost.
- Benefit cost ratio on total cost= Gross income / Total cost.

The marketing channels were identified based from the source factors of the point of production (farmers) to the ultimate consumers.

RESULTS AND DISCUSSIONS

The data was subjected to various statistical tools and graphs to obtain desired conclusions. Therefore, for better outcomes of the various facts of the subject, the results are presented in the following objectives:

- Socio-economic characteristics of the selected ginger growers
- Economics of ginger cultivation
- Marketing pattern of ginger in the study area

Socio-Economic Characteristics of the Ginger Growers

Socio-economic status is an important parameter for determining the level of the farmers' status. Hence a discussion on the socio-economic variables like land and its utilization patterns, economic status of the sampled population, working force and occupational pattern are presented below.

Distribution of Land USE Pattern According to Different Farm Size Groups

Table 2 represents land use pattern constituting about 97.72 percent of the total land available for use (143.6 ha). About 94.93 percent occupied cultivation area. The average area holding was found to be 1.77 ha. Out of this, homestead occupied 3.41 percent, 4.36 percent and 1.76 percent for marginal, small and medium groups respectively. About 1.36 percent, 0.21 percent and 0.24 percent for marginal, small and medium group respectively occupied animal husbandry. Bhende and Kalirajan, 2007

Table 2: Distribution of Household Sample According to Land Use Pattern Across Various Size Groups (Ha)

S. No	Size Group	Total Land Available For Use	Land Under Homestead	Land Under Animal Husbandry	Fallow Land	Fishery	Shifting Cultivation	Land Under Plantation	Total Operational Holding	Average Area Under Cultivation
1	Marginal	4.39 (3.03)	0.15 (3.41)	0.06 (1.36)	0.00	0.00	0.00	3.66 (83.37)	3.87 (88.15)	0.45
2	Small	37.33 (26.01)	1.63 (4.36)	0.12 (0.21)	0.00	0.00	0.00	34.94 (93.59)	36.69 (98.28)	1.66
3	Medium	101.88 (70.96)	1.80 (1.76)	0.25 (0.24)	0.00	0.00	0.00	97.73 (95.92)	99.78 (97.93)	3.21
Total		**143.6 (100.00)**	**3.58 (2.49)**	**0.43 (0.29)**	**0.00**	**0.00**	**0.00**	**136.33 (94.93)**	**140.34 (97.72)**	**1.77**

(Figures in parentheses indicate percentage to the total)

Distribution of Sample Population According to Economic Status

The findings of the study on their economic status were given in Table 3. The table showed 24.41 percent as working population of the total population. Male workers constituted about 26.80 percent and female workers 20.74 percent of the total population. The percent is lowest in marginal (3.21) percent, small 8.77 percent and medium 12.41 percent. About 18.41 percent were earner dependent and 57.17 percent as dependent population. Pramanik, 2008 also studied on the socio economic status of vegetable growers in Rajshahi region.

Below the Table 3 findings concluded that the working population increased with increase in the holding sizes. Dependent (57.17 per cent) population constituted the major economic share in the population sample. The male workers outnumbered female workers in the sample population of the study area.

Table 3: Distribution of Sample Population According to Economic Status Across Various Size Groups

S. No	Farm Size Group	Total Population			Workers / Earners			Earner Dependent			Dependent		
		M	F	T	M	F	T	M	F	T	M	F	T
1	Marginal	23.00 (8.24)	21.00 (11.17)	44.00 (9.42)	11.00 (3.94)	4.00 (2.12)	15.00 (3.21)	4.00 (1.43)	2.00 (1.06)	6.00 (1.28)	13.00 (4.65)	10.00 (5.31)	23.00 (4.66)
2	Small	81.00 (29.03)	63.00 (33.51)	144.00 (30.83)	29.00 (10.39)	12.00 (6.38)	41.00 (8.77)	11.00 (3.94)	6.00 (3.19)	17.00 (3.64)	49.00 (17.56)	37.00 (19.68)	86.00 (23.88)
3	Medium	175.00 (62.72)	104.00 (55.31)	279.00 (59.74)	35.00 (12.54)	23.00 (12.23)	58.00 (12.41)	37.00 (13.26)	26.00 (13.82)	63.00 (13.49)	87.00 (31.18)	71.00 (37.76)	158.00 (37.87)
	Total	279.00 (100.00)	188.00 (100.00)	467.00 (100.00)	75.00 (26.80)	39.00 (20.74)	114.00 (24.41)	52.00 (18.63)	34.00 (18.08)	86.00 (18.41)	149.00 (53.40)	118.00 (62.76)	267.00 (57.17)

(Figures in the parentheses indicate percentage to the total)

Farm Family Working Force and Its Occupational Pattern

Table 4 represented the occupational pattern of various farmer groups in the research study. From the findings that 68.17 percent of the working population engaged in agriculture as their main occupation. This was followed by service 13.85 percent, business 8.38 percent and others 11.81 percent. The male population engaged more in agriculture and in allied activities as compared to female population.

Table 4: Occupational Patterns of the Family Working Forces Across Various Size Groups

Farm Size Group	Total Population	Agriculture	Service	Business	Others
Marginal	44 (9.42)	40 (8.86)	0.00 (0.00)	2.00 (0.43)	2.00 (4.43)
Small	144 (30.83)	81 (17.34)	26 (5.5)	22 (4.72)	15 (3.21)
Medium	279 (59.74)	196 (41.97)	39 (8.35)	15 (3.21)	20 (4.20)
Total	467 (100)	317 (68.17)	65 (13.85)	39 (8.38)	37 (11.81)

(Figures in parentheses indicate percentage to the total)

Economics of Ginger Cultivation

Here, a study was conducted on the economics of ginger cultivation for various farmer groups. The findings found out from the study area were presented below.

Cost of Ginger Cultivation across Various Size Groups

The input cost of production included the like rhizomes; labour, marketing and transportation cost, working capital, rental value of land, depreciation, fixed assets. The economics of ginger cultivation on various farmer groups were tabled in table 5.

According to the findings, the overall average per hectare total cost of ginger production came to about Rs.8, 50,386.43. It was found out that the cost of planting material /rhizomes constituted the highest, secondly by hired human labour 19.10 percent, thirdly FYM & plant protection 11.85 percent, marketing cost 6.47 percent and transportation cost 4.63 percent. The TVC and TFC were found out to be 85.63 percent and 14.36 percent respectively. The cost increased according to their increased in their respective farm sizes. Bhende and Kalirajan, 2007, also reported similar findings.

From the table 5, it shows that, per hectare cost of ginger cultivation for the sample farmer was Rs.1,28,735, Rs.6,66,834.53, and Rs.17,55,589.73 for marginal, small and medium groups respectively with an average of Rs.8,50,386.43. Therefore, it can be concluded that the production cost increased with increase in their respective farm sizes. Ayodele and Sambo, 2014 also reported similar findings in their study.

Table 5: Item Wise Break Up Per Hectare Cost Of Ginger Cultivation Across Various Size Groups

S.	Particulars	Various Size Groups

No.		Marginal	Small	Medium	Average
(A)		Variable Cost			
1.	Planting material (Rhizomes)	21760 (16.90)	209500 (31.41)	575000 (32.75)	268753.33 (31.60)
2.	FYM & Plant protection	12000 (9.32)	73500 (11.02)	217000 (12.36)	100833.33 (11.85)
3.	Human Labour	19100 (14.83)	171500 (25.71)	509250 (29.00)	233283.33 (27.43)
(a)	Hired Labour	14600 (11.34)	111000 (16.64)	361750 (20.60)	162450 (19.10)
(b)	Family Labour	4500 (3.59)	60500 (9.07)	147500 (8.40)	70833.33 (8.32)
4.	Marketing cost	41575 (32.29)	53598 (8.03)	69890 (3.98)	55021 (6.47)
5.	Transportation cost	13000 (10.09)	42500 (6.37)	62678 (3.57)	39392.66 (4.63)
6.	Interest on working capital	2100 (1.63)	27453 (4.11)	63455 (3.61)	31002.66 (3.64)
	Total Variable Cost (TVC)	**109435 (85.00)**	**578051 (86.68)**	**1497273 (85.28)**	**728253 (85.63)**
(B)		Fixed Cost			
1.	Depreciation on fixed assets	4800 (3.72)	21900 (3.28)	62980 (3.5)	29893.33 (3.51)
2.	Interest on fixed assets	2500 (1.94)	15483.53 (2.32)	41456.78 (2.36)	19813.43 (2.32)
3.	Land Revenue	12000 (9.32)	51400 (7.70)	153880 (8.76)	72426.66 (8.51)
Total Fixed Cost (TFC)		**19300 (15.00)**	**88783.53 (13.31)**	**258316.78 (14.71)**	**122133.43 (14.36)**
Total Cost (TVC+TFC)		**128735 (100.00)**	**666834.53 (100.00)**	**1755589.78 (100.00)**	**850386.43 (100.00)**

(Figures in parentheses indicate percentage to the total)

Farm Profit Measures on Sample Farms

Table 6 revealed Farm Profit Measures on sample farms from ginger production. The cost concept of Cost A, Cost B_1, Cost B_2, Cost C_1, Cost C_2, and Cost C_3 were used in the study.

From table 6 it can seen that, the per hectare Cost A_1 included all cash expenses in the ginger cultivation varying from Rs. 1,00,235, Rs. 5,03,534.53 and Rs. 13,00,329.78 in marginal, small and medium farmer groups respectively with an average of Rs. 6,34,699.77. Medium group bored the maximum expenses and the lowest in marginal with an average of Rs.6, 34,699.77 per hectare. Selvan and Manoj Kumar, 2002 also reported similar findings. Cost B_1 estimation, it included the interest value of own capital asset excluding land to Cost A. From table 5 it can seen that, Medium group (Rs. 14, 47,829.78) occupied the maximum, followed by small (Rs. 5, 64,034.53) and marginal group (Rs. 1, 04,735) as lowest. The average estimation was found out to be Rs. 7, 05,533.10 per hectare. From table 5 it can seen that, Cost B_2 is the highest in medium (Rs. 13, 41,786.56), followed by small (Rs. 5, 19,018.06) and marginal group (Rs. 1, 02,735) as the lowest. The average estimation was found to be Rs. 6, 54,513.20 per hectare. Cost C_1 includes the imputed value of family labour to cost B_1. Based on the findings, it was found Rs. 1, 09,235, Rs. 6, 24,534.53 and Rs. 15, 95,329.78 per hectare for marginal, small and medium farmer groups respectively. The average C_1 expenses for all groups of farmer were found to be Rs. 7, 76,366.43 per hectare. Mishra and Ghadei, 2015 also reported similar findings.

Cost C_2 as shown in table 5, was found to be Rs. 1,07,235, Rs. 5,79,518 and Rs. 14,89,286.56 per hectare for marginal, small and medium farmer groups respectively. The average was reported to be Rs. 7, 25,346.52. The average C_3 cost for all farmer groups was estimated to be Rs. 72,534.60 per hectare. Estimation of Cost C_3 were Rs. 10,723.5, Rs. 57,951.80 and Rs. 1, 48,928.60 per ha marginal, small and medium respectively.

Gross Income

From table 6, it was revealed that, the gross income was found out to be Rs. 4, 53,790, Rs. 30, 45,390 and Rs. 80, 49,900 for marginal, small and medium groups respectively. The average gross income estimation for all farmer groups was found out to be Rs. 38, 49,693.33. Medium group farmers exhibited the maximum returns with marginal as lowest. Naresh et al., 2006 also reported similar findings in their study on economics of ginger cultivation in Haryana.

Family Labour Income

From table 6, it was revealed that, the family labour income was estimated by deducting Cost B_1 cost from gross income. Rs. 3,49,055, Rs. 24,81,355.47 and Rs. 66,02,070.22 per hectare for marginal, small and medium farmer groups respectively were their family labour income per ha.. The average was found Rs. 31, 44,160.23 per hectare. Medium group showed as highest and the lowest in marginal group in the study area. This showed that all farmer groups exhibited more hired labour than owned labour for the ginger cultivation.

Net Return

It can be seen from table 6 that, the average net return was found out to be Rs. 30, 73,326.90. Medium group (Rs. 64, 54,570.22) exhibited the highest and the lowest in marginal group (Rs. 3, 44,555). The research study showed that the net income increased with increased in their farm sizes. Philp et.al, 2012 also reported similar findings.

Benefit Cost Ratio

The BCR was found to be 1:4.14, 1:5.26 and 1:5.37 for marginal, small and medium farmer groups respectively. Medium group (1:4.58) showed the highest and the lowest in marginal group (1:3.52). The Benefit Cost Ratio average total cost for the all groups in the study area was found out to be 1:4.2. Tripathi et al., 2015 also reported similar findings in their study.

Table 6: Farm Economics on Ginger Cultivation Per Sample Group (Rs)

S. No.	Particulars	Farm Size Group			
		Marginal	Small	Medium	Average
1.	Gross Income	453790	3045390	8049900	3849693.33
2.	Total Fixed Cost (TFC)	19300	88783.53	258316.78	122133.43
3.	Total Variable Cost (TVC)	109435	578051	1497273	728253
4.	Total Cost (TFC+TVC)	128735	666834.53	1755589.78	850386.43
5.	Cost A	100235	503534.53	1300329.78	634699.77
6.	Cost B_1	104735	564034.53	1447829.78	705533.10
7.	Cost B_2	102735	519018.06	1341786.56	654513.20
8.	Cost C_1	109235	624534.53	1595329.78	776366.43
9	Cost C_2	107235	579518	1489286.56	725346.52
10.	Cost C_3	10723.5	57951.8	148928.6	72534.6
11.	Net Income (Gross income - Cost C_1)	344555	2420855.47	6454570.22	3073326.90
12.	Family labour income (Gross income - Cost B_1)	349055	2481355.47	6602070.22	3144160.23
13.	Farm Business Income (Gross income - Cost A)	353555	2541855.47	6749570.22	3214993.56
14.	BCR on Variable Cost	1:4.14	1:5.26	1:5.37	1:4.9
15.	BCR on Total Cost	1:3.52	1:4.56	1:4.58	1:4.2

Channels Involved In Marketing of Ginger

The path followed by these commodities till they reach to final consumer is known as marketing channels**.** The

length of channels depends on the quantity to be moved, the nature and degree of specialization. In the present study, two marketing channels of ginger in both the selected blocks of Wokha district of Nagaland were identified. The two marketing channels are as follows:

Channel I: Producer-Consumer

Channel II: Producer–Wholesaler–Consumer

Table 7 showed the quantity sold through different channels. Channel II was the most effective channel. About 00.00, 83.28 and 90.59 percent for marginal, small and medium groups respectively were their marketed surplus. Approximately 3035.27 q or 85.13 percent was sold through channel II. In Channel I marginal farmers sold 100 per cent of their marketed surplus. About 529.96 q or 14.86 percent was sold through Channel I.

Table 7: Effectiveness of various marketing channels of ginger cultivation across various size groups

S. No	Channel	Marginal		Small		Medium		Average	
		Qty (q)	%	Qty (q)	%	Qty (q)	%	Qty (q)	%
1	I	138.13	100.00	158.86	16.71	232.97	9.40	529.96	14.86
2	II	00.00	00.00	791.18	83.28	2244.09	90.59	3035.27	85.13
Total		138.13	100.00	950.04	100.00	2477.06	100.00	3565.23	100.00

Marketed and Marketable Surplus of Ginger Production

Table 8 showed that the production, family consumption, marketable surplus and marketed surplus of ginger production. The average size of land holding under ginger cultivation was found 0.45, 1.66 and 3.15 for marginal, small and medium farmer groups respectively. The average production per hectare was the highest in marginal farmer group. From the findings, marketed surplus was higher than marketable surplus for all farmer groups. This is due to the fact that ginger loses its pungency over time and whereas the farmers incentive for hard cash for meeting their daily family consumption and other necessities. Gupta and Sharma, 2010, also did similar study in their research.

Table 8: Area, production, marketable and marketed surplus of ginger cultivation across various size groups

S. No.	Sample Group	Area Under Ginger Cultivation (ha)	Production (Q)	Av. Area Under Ginger Cultivation (ha)	Per ha Production (Q)	Requirement for Family Consumption + Non Market Transaction	Marketable Surplus (Q)	Marketed Surplus (Q)
1	Marginal	3.66	151.93	0.45	41.51	18.65	133.28	138.13
2	Small	34.94	1015.13	1.66	29.05	76.02	939.11	950.04
3	Medium	97.73	2683.30	3.15	27.45	210.56	2472.74	2477.06
Total		136.33	3850.36	5.26	98.01	305.23	3545.13	3565.23
Average		45.44	1283.45	1.75	32.67	101.74	1181.71	1188.41

CONCLUSIONS

From the study on economics and marketing pattern of ginger cultivation in Wokha district of Nagaland, following conclusions were drawn. The average family size was found to be 7.12 and 24.41 percent constituted the working population with males outnumbering females. Agriculture is pre-dominantly the main occupation (68.17 per cent) where an average size of land holdings was 2.39 ha. The average area under ginger cultivation was found to be 1.77 ha and the average yield per hectare was 32.5q. It was found out that the average cost of ginger cultivation Rs. 8, 50,386.43 from all groups of farmers. The net return per hectare was the highest in medium group (Rs. 64,

54,570.22) and the lowest in marginal group (Rs. 3, 44,555.00). The net income was found to increase with increase in farm sizes. The Benefit Cost Ratio (BCR) was found out to be 4.2. It was also concluded that marketed surplus was higher than marketable surplus for all groups of farmer. Two marketing channels were identified namely; Producer - Consumer (channel - I) and Producer - Wholesaler - Consumer (channel - II). Channel - II proved to be the most efficient channel.

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