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Socio-economic status and constraints faced by Ginger (*Zingiber officinale*) Growers in production and marketing systems: Evidence from Niuland District of Nagaland, India

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Abstract

The present study entitled “Socio-Economic Status and Constraints Faced by Ginger (*Zingiber officinale*) Growers in Production and Marketing systems: Evidence from Niuland District of Nagaland, India” was undertaken to analyze the socio-economic profile of ginger growers and identify the major constraints in production and marketing. The study was conducted in Niuland district of Nagaland, which was purposively selected due to its prominence in ginger cultivation. A multistage sampling technique was employed and a total of 90 respondents were selected from two blocks, namely Aghunaka and Ato. Primary data were collected through personal interviews using a structured schedule, while secondary data were gathered from various published sources. The data were analyzed using descriptive statistics and Garrett’s ranking technique to identify and rank the constraints. The results revealed that the majority of farmers (61.11%) belonged to the middle age group and female participation (52.22%) was slightly higher than male participation. Most respondents had primary level education (55.55%), medium-sized families (56.66%) and small landholdings (56.66%). Ginger occupied the largest share (33.84%) of land use highlighting its importance as a major cash crop. Income analysis showed that the majority of farmers earned between ₹2,50,000 and ₹5,00,000 annually. The Garrett ranking analysis indicated that lack of good quality rhizomes, declining soil fertility, and lack of funds were the major production constraints. In marketing, price fluctuation, lack of storage facilities and absence of farmer organizations were the most critical challenges. These constraints significantly affect productivity, income stability and market efficiency. The study concludes that improving access to quality inputs, strengthening extension services, developing storage and transportation infrastructure and promoting farmer organizations can enhance the productivity and profitability of ginger cultivation in the region.

Keywords: Ginger, socio-economic status, constraints, Garrett ranking, Nagaland

Introduction

India is widely recognized as one of the leading producers and exporters of spices in the world, contributing significantly to global spice trade. A wide variety of spices such as ginger, garlic, chilli, pepper, turmeric, coriander and cardamom are cultivated across different agro-climatic regions of the country. Among these, ginger (*Zingiber officinale*) is an important commercial spice crop that plays a vital role in enhancing farmers’ income and supporting rural livelihoods, particularly in states like Kerala, Karnataka, Assam, Meghalaya, Sikkim and other North-Eastern regions of India. Bhutia *et al.* (2022) ^[4] Ginger is a monocotyledonous, herbaceous, tropical plant belonging to the family *Zingiberaceae*, primarily cultivated for its underground rhizome. It is valued not only as a spice

but also for its medicinal and industrial uses. The crop is widely used in culinary preparations and traditional medicine systems due to its antioxidant, anti-inflammatory, antimicrobial and immunomodulatory properties. The increasing awareness of health benefits, especially during recent global health crises, has further boosted the demand for ginger in both domestic and international markets. In addition, ginger serves as a raw material for various value-added products such as dried ginger, ginger powder, essential oil and oleoresin. Ali *et al.* (2008) ^[1].

In India, ginger is cultivated in several states, with major contributions from Madhya Pradesh, Karnataka, Assam, West Bengal and Odisha. The North-Eastern region, in particular holds immense potential for ginger cultivation due to its favorable climatic conditions, abundant rainfall and

suitable soil characteristics. In Nagaland, ginger is considered one of the major cash crops and is cultivated extensively, contributing significantly to the income and livelihood of farmers. Despite its economic importance and growing demand, ginger cultivation is faced with several challenges, particularly at the production and marketing levels. Issues such as lack of quality planting material, declining soil fertility, pest and disease incidence, price fluctuations, inadequate storage facilities and poor market infrastructure hinder the productivity and profitability of the crop. These constraints are more pronounced among small and marginal farmers, who dominate the agricultural landscape in the region. Bhutia and Mula (2022) [3].

Niuland district of Nagaland has witnessed a considerable expansion in ginger cultivation in recent years due to its suitability for the crop and its income-generating potential. However, systematic studies focusing on the socio-economic status of ginger growers and the constraints affecting production and marketing in this district are limited. Understanding these aspects is crucial for designing appropriate interventions and policy measures to improve productivity, enhance income and ensure sustainable development of the ginger sector. Therefore, the present study was undertaken to examine the socio-economic status of ginger growers and to identify the major production and marketing constraints in ginger cultivation in Niuland district of Nagaland.

Methodology

The present study was conducted in the state of Nagaland, where ginger is an important income-generating crop for farmers, and the recently established Niuland district (18 December 2021) was purposively selected due to its considerable area under ginger cultivation. Among the four blocks of the district, namely Aghunaka, Khaghaboto, Kuhuboto, and Ato, two blocks—Aghunaka and Ato—were selected purposively based on the extent of ginger cultivation. From each selected block, three villages were chosen, namely Hozheto, Zuheshe and Shittoi from Aghunaka block, and Viheto, Hetoi and Ghokuto from Ato block, considering the prevalence of ginger farming and availability of experienced farmers. A list of farmers engaged in ginger cultivation with at least 3–4 years of experience and deriving 30–40 per cent of their income from the crop was prepared, from which 15 respondents were randomly selected from each village, making a total sample size of 90 respondents. The selected farmers were further classified into marginal (<1 ha), small (1–2 ha), and medium (>2 ha) categories based on landholding size. The study was based on both primary and secondary data; primary data were collected through personal interviews using a pre-tested structured interview schedule, whereas secondary data were obtained from textbooks, journals, reports, and concerned departments. The collected data were processed, classified, tabulated, and analysed systematically using appropriate statistical and analytical tools in accordance with the objectives of the study to assess the socio-economic characteristics, economics and constraints in ginger cultivation.

Constraints in ginger cultivation

Garrett's ranking technique was implied to identify the

different constraints through the interview schedule with respondents.

$$\text{Percent position} = 100 (\text{R}_j - 0.5) / \text{N}_j$$

Where, R_j = Rank given for the i th variable by respondents
 N_j = Number of variables ranked by the j th respondents

Results and Discussion

Socio-economic profile of ginger growers

The socio-economic characteristics of the sample ginger growers play a significant role in influencing their farming decisions, adoption of improved technologies and overall productivity. The details of various socio-economic variables such as age, gender, family size, education, occupation, landholding, land use, workforce and income are presented in Table 1.

The age distribution of the respondents indicates that the majority of ginger growers (61.11%) belonged to the middle age group of 36–55 years, followed by 35.55% in the older age group (>55 years), while only 3.33% of the respondents were in the younger age group (18–35 years). This implies that ginger cultivation is largely practiced by experienced and economically active individuals, whereas the participation of youth in agriculture is relatively low. Thakuria *et al.* (2025) [17] reported that majority of the respondents (43.75%) were in the middle-aged group in adoption of recommended litchi production technology. Toppo (2005) [20] revealed that majority (71.67 per cent) of farm women belonged to middle age group followed by 26.67 per cent of them with young age and 1.66 per cent with old age group.

With respect to gender distribution, female respondents (52.22%) slightly outnumbered male respondents (47.77%). This highlights the active involvement of women in ginger cultivation and reflects the important role played by women in agricultural activities in the study area. Rakesh and Naik (2022) [12] revealed that the majority of respondents (86.66 percent) were males, whereas 13.34 percent female. Our country's social structure and familial relationships heavily influence women's roles in the household.

The classification of respondents based on family size shows that the majority (56.66%) belonged to medium-sized families (5–9 members), followed by large families (22%) and small families (18.88%). A larger family size generally contributes to the availability of family labour, which can reduce the cost of hired labour in farming operations. Banerjee and Biradar (2016) [2] found that most of the fodder growers (66.32%) belonged to category of small family size followed by medium family size (32.63%) and only large family size (1.05%). Pradesh (2019) [11] reported that more than two-third (64.17%) of the nursery owners had medium family size followed by small (5.83%) and finally 4.17 per cent of them had very large family size. Sonowal (2012) [16] also found that the majority of respondents (52.00%) had small families.

The educational status of the respondents revealed that more than half (55.55%) had primary level education, while 16.66% had PU/HS level education, 15% were graduates, and 12.22% were illiterate. The predominance of primary-level education suggests limited access to higher education, which may affect the adoption of modern agricultural

practices and technologies. Singh (2007) ^[15] indicated that majority (58.83 per cent) of the respondents were educated up to secondary and higher secondary level, remaining 25.00 and 16.66 per cent were educated above higher secondary education and primary level of education, respectively.

Occupational distribution indicated that agriculture was the primary occupation for 44.44% of the respondents, followed by business (27%), service (19%), and other occupations (10%). This clearly shows that agriculture continues to be the main source of livelihood for a large proportion of the sample growers. Shanaz *et al.* (2010) ^[13] reported that only 40.00 per cent of the respondents had poultry farming as major occupation, followed by business (34%), service (16%), agriculture (6%) and contractor (4%).

Landholding pattern analysis revealed that the majority of respondents (56.66%) belonged to the small farmer category (1–2 ha), followed by medium farmers (24%) and marginal farmers (19%). The average landholding size was found to be relatively small, indicating fragmented land distribution and limited resource availability. Thakuria *et al.* (2024) ^[19] reported that majority of the respondents (41.25%) were small farmers followed by 33.75 per cent respondents were marginal farmers. 17.50 per cent of respondents belonged to medium category of farmers. Only 7.50 per cent of respondents were semi-medium farmers. Pandey *et al.* (2015) ^[10] found out that majority (75.56%) of tribal fish farmers had small size (<5 acre) of land holding.

The land use pattern of the sample farmers showed that out of the total operational land (144.90 ha), the highest

proportion was allocated to ginger cultivation (33.84%), followed by plantation crops (25.75%). Fallow land accounted for 16.01%, land under dwelling house for 13.24%, rice cultivation for 9.36%, and fishery for 1.77%. This clearly indicates that ginger is a major cash crop in the study area and occupies a significant share of cultivated land.

The workforce distribution of the sample population (N = 328) revealed that full-time workers constituted the largest share (41.46%), followed by part-time workers (36.89%) and helpers (21.64%). This indicates that a substantial proportion of the population is actively engaged in agricultural and allied activities.

The analysis of annual income showed that the majority of respondents (54%) earned between ₹2,50,000 and ₹5,00,000, followed by 33.33% earning above ₹5,00,000 and only 12.22% earning between ₹1,00,000 and ₹2,50,000. This suggests a moderate level of income among the sample farmers. Chandramouli (2005) ^[5] found that majority of small farmers (42.50%) fell into the semi-medium income category, whereas the majority of medium (47.50%) and large (95.00%) farmers fell into the high-income category. Further, the contribution of various activities to total family income revealed that agriculture contributed the highest share (21%), followed by plantation (20%) and ginger (19%). Livestock contributed 14%, while service, business, and other sources contributed 12%, 8% and 4% respectively. Fishery accounted for the least share (2%). The total annual income from all activities was estimated at ₹2,47,78,100.

Table 1: Socio-Economic Profile of Ginger Growers

Sl. No.	Variable	Category	Frequency	Percentage (%)
1	Age	18–35 years	5	3.33
		36–55 years	53	61.11
		>55 years	32	35.55
		Total	90	100
2	Gender	Male	43	47.77
		Female	47	52.22
		Total	90	100
3	Family Size	Small (<4 members)	17	18.88
		Medium (5–9 members)	51	56.66
		Large (>10 members)	22	22
		Total	90	100
4	Education	Illiterate	11	12.22
		Primary	50	55.55
		PU/HS	18	16.66
		Graduate	11	15
		Total	90	100
5	Occupation	Agriculture	40	44.44
		Service	17	19
		Business	24	27
		Others	9	10
		Total	90	100
6	Land Holding	Marginal (<1 ha)	17	19
		Small (1–2 ha)	51	56.66
		Medium (2–3 ha)	22	24
		Total	90	100
7	Land Use Pattern (ha)	Dwelling house	18.77	13.24
		Rice cultivation	13.28	9.36
		Fallow land	23.10	16.01
		Plantation	36.50	25.75
		Ginger	50.73	33.84

		Fishery	2.50	1.77
		Total	144.90	100
8	Workforce (N=328)	Full-time	136	41.46
		Part-time	121	36.89
		Helper	71	21.64
		Total	328	100
9	Annual Income (₹)	1,00,000–2,50,000	11	12.22
		2,50,000–5,00,000	49	54
		Above 5,00,000	30	33.33
		Total	90	100
10	Family Income Sources	Agriculture		21
		Plantation		20
		Ginger		19
		Livestock		14
		Service		12
		Business		8
		Others		4
		Fishery		2
		Total Income (₹)	2,47,78,100	100

Constraints faced by Ginger (*Zingiber officinale*) Growers

The study identified several constraints affecting ginger cultivation, which were broadly categorized into production and marketing constraints.

Constraints in Production

The production constraints faced by ginger growers were analysed using Garrett's ranking technique, which helps in prioritizing the problems based on their severity as perceived by the respondents.

The results indicate that lack of good quality rhizomes was the most severe constraint with the highest Garrett's mean score of 54.71, ranking first. This suggests that farmers largely depend on locally available planting materials, which are often of inferior quality and susceptible to diseases. The absence of certified and disease-free rhizomes significantly affects crop yield and overall productivity.

The second major constraint was reduction in soil fertility, with a Garrett's mean score of 52.72. Continuous cultivation of ginger without proper soil management practices such as crop rotation, organic manure application and soil testing has led to nutrient depletion, thereby reducing productivity over time.

Lack of funds was ranked third (mean score: 51.18), indicating that financial limitations restrict farmers from purchasing quality inputs such as improved seeds, fertilizers and plant protection chemicals. Limited access to institutional credit further aggravates this problem, especially among small and marginal farmers.

The incidence of pests and diseases ranked fourth with a mean score of 48.04. Diseases such as rhizome rot and pest infestations significantly reduce yield and quality of produce. The problem is intensified due to lack of awareness regarding proper pest and disease management practices. Momin *et al.* (2018) ^[8] reported that insect pests are one of the major constraints in the cultivation of ginger in Meghalaya.

Finally, lack of technical knowledge was identified as another important constraint (mean score: 41.23). Although ranked sixth, it still plays a critical role in limiting the adoption of improved agricultural practices, scientific cultivation methods and efficient resource management.

Overall, the analysis reveals that input-related constraints (quality planting material, soil fertility and finance) are more severe compared to knowledge-based constraints, highlighting the need for improved input supply systems and institutional support. Dhenge and Ovhar (2014) ^[6] reported that the majority of turmeric growers (50.56%) faced with constraints like inadequate availability of improved seed. Thakuria (2023) ^[18] reported that majority of litchi growers faced problem of high cost of good quality inputs.

Constraints in Marketing

The marketing constraints were also analysed using Garrett's ranking technique and the results highlight several issues affecting the efficient disposal of ginger produce.

The most significant constraint was price fluctuation, which secured the first rank with the highest Garrett's mean score of 60.52. This indicates that farmers face uncertainty in income due to unstable market prices, often leading to distress sales during peak harvesting periods. Michael (2011) ^[7] reported that marketing was the most important constraint in ginger cultivation. Sharma and Gupta (2010) ^[14] reported that majority of the chilli growers faced problems, like massive price fluctuation of the produce, lack of support price of chilli, lack of knowledge of raising nursery, low price at peak time and high cost of hybrid seeds.

The second major constraint was the problem of storage, with a mean score of 56.31. Due to the perishable nature of ginger and lack of scientific storage facilities, farmers are compelled to sell their produce immediately after harvest often at lower prices.

Lack of organization among producers was ranked third (mean score: 52.48). The absence of farmer groups or cooperatives limits collective bargaining power and reduces farmers' ability to access better markets and prices.

The low marketable surplus ranked fourth with a mean score of 49.72. Small landholdings and limited production capacity result in lower surplus for sale, which reduces farmers' participation in larger markets and weakens their market position.

Inadequate transport facility was ranked fifth (mean score: 45.16), indicating that poor road connectivity and high

transportation costs hinder farmers from accessing distant and more profitable markets. Odyuo *et al.* (2017) ^[9] reported that in Nagaland communications and transportation facilities was inadequate as reported by functionaries of NGOs.

Lastly, absence of market information was ranked sixth with a mean score of 34.37. Lack of timely information regarding market prices, demand trends and marketing opportunities prevents farmers from making informed decisions.

Table 2: Constraints in Production

Sl. No.	Particulars	Garrett's Mean Score	Rank
1.	Lack of good quality Rhizomes	54.71	I
2.	Reduction in soil fertility	52.72	II
3.	Lack of funds	51.18	III
4.	Incidence of pests & diseases	48.04	IV
5.	Lack of technical knowledge	41.23	VI

Table 3: Constraints in Marketing

Sl. No.	Particulars	Garrett's Mean Score	Rank
1.	Price fluctuation	60.52	I
2.	Problem of storage	56.31	II
3.	Lack of organization among Producers	52.48	III
4.	Low marketable surplus	49.72	IV
5.	Inadequate transport facility	45.16	V
6.	Absence of market information	34.37	VI



Plate 1: Researcher with respondents from Aghunaka block



Plate 2: Ginger stored by the respondents

Conclusion

The present study on “Socio-Economic Status and Production-Marketing Constraints in Ginger (*Zingiber officinale*) Cultivation: Evidence from Niuland District of Nagaland” highlights the significant role of ginger cultivation in sustaining the livelihood of farmers in the study area. The socio-economic analysis revealed that

ginger cultivation is predominantly practiced by middle-aged farmers with small landholdings, moderate income levels and primary-level education. The active participation of women in farming activities further emphasizes the labour-intensive nature of ginger cultivation in the region. The findings clearly indicate that ginger is a major cash crop, occupying a substantial proportion of cultivated land and contributing significantly to household income. However, despite its economic importance, the productivity and profitability of ginger cultivation are constrained by several production and marketing challenges. The Garrett ranking analysis identified lack of quality planting material, declining soil fertility and financial constraints as the major production-related issues. Similarly, price fluctuation, inadequate storage facilities, lack of farmer organizations and poor market infrastructure were found to be the key marketing constraints affecting farmers' income and market efficiency. These constraints not only reduce productivity but also limit farmers' ability to realize better prices and sustain their livelihoods. Therefore, addressing these challenges through the supply of improved planting material, strengthening extension services, improving soil health management and ensuring access to institutional credit is essential. Additionally, the development of storage and transportation infrastructure, promotion of farmer producer organizations (FPOs), and provision of timely market information can significantly enhance marketing efficiency. Ginger cultivation in Niuland district has strong potential for income generation and livelihood improvement. However, a coordinated approach involving technological, institutional and policy-level interventions is necessary to overcome existing constraints and ensure sustainable development of the ginger sector in the region.

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