

Ginger Cultivation Beyond Borders: Drivers, Economics and Challenges of Wayanad Farmers' Shift to Karnataka

Seena Devi^{1*} and Anushima Lal²

¹Associate Professor, Post Graduate Department of Economics, NMSM Government College, Kalpetta, Wayanad, Kerala, India

²Postgraduate Student, Post Graduate Department of Economics, NMSM Government College, Kalpetta, Wayanad, Kerala, India

**Corresponding author: Seena Devi, Associate Professor, Post Graduate Department of Economics, NMSM Government College, Kalpetta, Wayanad, Kerala, India. Email: seenabeeyes@gmail.com*

Abstract: This article examines the interstate movement of ginger cultivation by farmers from Wayanad district of Kerala to Karnataka and analyses factors associated with this shift. The study is based on primary data collected from 100 Wayanad-origin ginger farmers cultivating on leased land in Karnataka. A descriptive and analytical research design is adopted, using percentages, frequency distributions and farm-level cost, yield and price indicators. The findings show that interstate ginger cultivation is undertaken by experienced farmers: 79 per cent of respondents are aged 45 years or above, 67 per cent have more than five years of ginger-farming experience, and 78 per cent depend on ginger as their primary source of income. Lease farming is central to the system, with 99 per cent cultivating leased land and 85 per cent paying between ₹1.0 lakh and ₹1.25 lakh per acre annually. Ginger cultivation is capital intensive, as 81 per cent report total cultivation costs of ₹6-8 lakh per acre. At the same time, 98 per cent perceive yield and quality to be better in Karnataka, 81 per cent expect 400-550 sixty-kilogram bags per acre, and 89 per cent receive ₹5,500-7,000 per quintal. Land availability emerges as the strongest migration driver, while irrigation scarcity, wildlife damage and rhizome rot remain risks. The article argues that interstate ginger cultivation is an adaptive livelihood strategy, but its sustainability requires formal lease arrangements, institutional credit, crop insurance, stronger farmer organizations, improved market infrastructure and environmentally responsible production practices.

Index Terms - ginger cultivation; agricultural migration; Wayanad; Karnataka; lease farming; farm economics; agricultural marketing; livelihood strategy

I. INTRODUCTION

Agriculture continues to be an important source of livelihood in rural India, and commercial crops occupy a special position in regions where farm households depend on market income. Spices are particularly important because they combine domestic demand, processing use and export potential. Ginger (*Zingiber officinale* Roscoe) is one of the major commercial spice crops grown in India and is widely used in food, pharmaceutical, nutraceutical and processing industries. Kerala has a long history of ginger cultivation, and Wayanad has been one of the important spice-growing districts of the state. Its humid climate, high rainfall and farming experience have supported the development of ginger as a high-value crop. However, ginger is also a crop involving high investment, substantial labour requirements and considerable production and price risk. Earlier farm-economics research in Wayanad showed that seed, labour and machinery formed major components of cost and that farm returns differed according to scale (Mathew et al., 2018).

During the last two decades, an important change has taken place in the geography of ginger cultivation among Wayanad farmers. Many cultivators have moved their production activity beyond Kerala and have taken agricultural land on lease in neighbouring Karnataka. This movement is different from permanent migration. Farmers generally retain their residence and social base in Wayanad while organizing seasonal commercial cultivation in Karnataka. The practice has expanded through networks of farmers, labourers, traders, landowners, transporters and commission agents. The survey covered farmers operating in Mysuru, Nanjangud, Kodagu, Gundlupete, H.D. Kote, Shivamogga, Hassan, Periyapatna, Siddapura, Hunsur and Chikkamagaluru, demonstrating that the cultivation frontier has spread across several parts of Karnataka. The broader Mysuru-Chamarajanagar belt alone accounted for a large share of current cultivation locations in the survey.

The movement is linked with a combination of push and pull factors. In Wayanad, land fragmentation, high land values, repeated cultivation on the same soils, disease incidence, labour costs and limits to physical expansion have made large-scale ginger cultivation increasingly difficult. In Karnataka, by contrast, farmers perceive greater availability of contiguous land on lease, new soils, favourable agro-climatic conditions and better scope for commercial-scale cultivation. Such factors are consistent with Münster's (2015) description of ginger as a speculative boom crop associated with seasonal mobility, leased land and high financial risk. The present survey also shows that 99 per cent of respondents find it easier to obtain large plots in Karnataka, making land availability a particularly strong structural factor behind the shift.

The economic outcome of this movement, however, cannot be understood only in terms of land access. Interstate cultivation involves high upfront expenditure on lease rent, seed rhizomes, fertilizers, crop protection, labour, irrigation and transportation. It also exposes farmers to price fluctuations, disease, rainfall uncertainty, human-wildlife conflict and informal institutional arrangements. At the same time, high expected yield, favourable market prices and the possibility of operating larger holdings can produce attractive returns. Therefore, this article studies interstate ginger cultivation as an adaptive livelihood and commercial farming strategy. It examines who participates in this system, why farmers shift cultivation to Karnataka, the cost-yield-price structure of the enterprise, the major constraints, and the policy measures required to improve its economic and environmental sustainability.

II. STATEMENT OF THE PROBLEM

Ginger has traditionally generated farm income and employment in Wayanad, but its cultivation has become increasingly difficult under changing economic and ecological conditions. The crop requires substantial working capital, is vulnerable to rhizome diseases and weather shocks, and is exposed to volatile market prices. Land fragmentation in Wayanad has also reduced the possibility of expanding commercial cultivation on contiguous plots. In response, many experienced farmers have adopted a cross-border strategy by leasing land in Karnataka. This has created a distinctive system in which production is geographically separated from the farmer's home base and depends on temporary land contracts, mobile labour, trader networks and inter-state transport.

The shift may improve access to land and yield, but it can also increase financial and institutional vulnerability. Farmers invest heavily on land that they do not own, often for a short cultivation period. Crop failure, disease or a sudden fall in price can therefore convert a profitable season into a major financial loss. Dependence on intermediaries and inadequate access to formal credit, insurance, storage and organized marketing may further reduce farmers' bargaining position. The central research problem is consequently not whether farmers are merely moving from one state to another, but whether this new geography of cultivation provides a sustainable economic response to the constraints experienced in Wayanad.

III. REVIEW OF LITERATURE

The literature on ginger cultivation can be broadly grouped into studies on farm economics, productivity and technology, agrarian risk and migration, and sustainability. Mathew et al. (2018), in a study of 80 farmers in Wayanad, found that cultivation cost and gross returns increased with farm size. Seed was the single largest cost component, accounting for about 35 per cent of total cost, followed by human labour and machine power. Their results establish the high-input nature of ginger cultivation and provide an important benchmark for understanding why farmers seek scale economies and alternative production locations.

A second group of studies focuses on productivity and the role of knowledge, farm size and extension. Mmasa and Mhagama (2017), using evidence from smallholder ginger growers in Tanzania, found that education, fertiliser use, land under ginger and contact with extension services significantly influenced productivity. Sundresha et al. (2020) similarly emphasized the importance of farmers' knowledge of improved cultivation practices in Hassan district, Karnataka. These studies suggest that productivity depends not only on natural conditions but also on managerial experience, technology adoption and extension support. This is relevant to Wayanad-origin farmers because many respondents in the present survey are experienced cultivators who carry production knowledge across state boundaries.

The agrarian migration dimension is most directly addressed by Münster (2015), who analyses the seasonal movement of Wayanad cultivators to other states for ginger production. He characterized ginger as a high-risk 'gamble' and a boom crop associated with large capital investment, leased land, uncertain crop outcomes and flexible movement to new soils. His account is particularly important because it treats migration as part of the political economy of agrarian uncertainty rather than as a simple search for employment. The present study provides a later quantitative perspective on this process and shows that land availability, commercial scale and perceived yield advantage continue to be major factors in interstate cultivation.

Environmental and climate-related studies add another dimension. Kumar et al. (2025) reviews the sensitivity of ginger to changes in temperature, rainfall and extreme weather and stress the importance of organic practices, integrated pest management and efficient irrigation. Nair (2019) provides a wider agronomic and economic account of ginger, including its production environment, processing and market significance. Research on organic ginger also shows that profitability can be combined with improved soil and crop management when farmers have access to suitable technology and institutional support. Together, these studies indicate that the long-term viability of commercial ginger farming depends on balancing profitability with soil health, water management and disease control.

Existing literature therefore provides useful evidence on costs, productivity, risk, migration and sustainability, but an empirical gap remains in relation to the present form of interstate farming by Wayanad cultivators in Karnataka. Most farm-economics studies are location-specific, while agrarian migration studies are often qualitative. There is comparatively few recent surveys evidence combining farmer characteristics, leased-land dependence, cost brackets, expected yield, realised prices, farmer satisfaction, land-access motivations and production challenges within the same analytical framework. This article attempts to address that gap using primary survey evidence from 100 migrant ginger farmers.

A third element is the relationship between expected return and risk. Commercial ginger cultivation has a high fixed and variable cost structure. Lease rent is paid before harvest, seed and input expenditure is substantial, and disease or adverse weather can sharply reduce output. Farmers will continue to accept this risk only when expected revenue is sufficiently high. In this study, perceived superior yield, market prices and high reported financial satisfaction indicate that farmers currently view the expected benefit as sufficient to justify the risks. However, the same structure makes the system vulnerable to a simultaneous adverse shock in yield and price. The conceptual framework used in this article therefore treats the interstate shift as an adaptive but risk-intensive form of commercial agriculture in which land access, ecological conditions, farmer capability, market organization and institutional support jointly determine sustainability.

This perspective can also be linked to livelihood adaptation. Farm households do not always respond to agrarian stress by leaving agriculture. Experienced farmers may instead reorganize where and how agriculture is carried out. Interstate ginger cultivation allows Wayanad farmers to retain their occupational identity, technical knowledge and household base while changing the location of production. This is important because the respondents are not predominantly landless labour migrants; they are cultivators who mobilize capital, knowledge and social networks to gain temporary control over land in another state. The livelihood strategy therefore involves both continuity and change: continuity in the crop and farming skill, and change in the geographical location, land-tenure arrangement and marketing environment.

The movement of ginger cultivation from Wayanad to Karnataka can be interpreted through a simple push-pull framework. Push factors are conditions in the home region that reduce the feasibility or profitability of continued expansion, while pull factors are conditions in the destination region that offer a comparative advantage. In the present case, the major push factors include fragmented holdings, difficulty in assembling large plots, repeated cultivation and associated soil and disease problems, high local land values, and limits to scaling up commercial production. The main pull factors include easier access to contiguous leased land,

perceived better yield and quality, favorable agro-climatic conditions, established transport routes, farmer networks and market linkages. The decision to migrate cultivation is therefore not caused by a single variable. It represents a combined response to relative differences in land, production risk, scale and expected income across the two regions.

IV. OBJECTIVES OF THE STUDY

- 1 To analyses the cost and economic characteristics of ginger cultivation undertaken by Wayanad farmers in Karnataka.
- 2 To examine the production and marketing conditions associated with interstate ginger cultivation.
- 3 To identify the major challenges and opportunities experienced by Wayanad-origin ginger farmers cultivating in Karnataka.
- 4 To assess the principal factors motivating farmers to shift their ginger cultivation activities from Wayanad to Karnataka.

V. METHODOLOGY

5.1 Research design and study area

The study adopts a descriptive and analytical research design. The descriptive component is used to present the socio-economic profile of the respondents, their farming experience, cultivation scale, land tenure, production conditions and major constraints. The analytical component interprets the cost, yield and price indicators in relation to the reasons for interstate movement. The original project identifies Wayanad-origin farmers cultivating in Karnataka as the study population. The survey results show cultivation spread across several locations, with Mysuru, Nanjangud, Kodagu and Gundlupete forming important centres. This article therefore treats the study area as the Karnataka destinations represented in the survey rather than restricting interpretation to a smaller set of districts named in the preliminary methodology section of the dissertation.

5.2 Data, sampling and analytical tools

Primary data were collected through a structured interview schedule from 100 Wayanad-origin ginger farmers cultivating in Karnataka. The original study used purposive sampling because the target population is a specific and mobile group of interstate cultivators. Personal interviews were supplemented by informal discussion and field observation. Secondary information was drawn in the dissertation from government publications, agricultural departments, the Spices Board of India, research literature and other published sources. The present article uses the reported primary survey tables and the literature cited in the project, with selected bibliographic details verified for journal-standard reference.

The analysis uses frequencies, percentages and grouped farm indicators. Attention is given to age, farming experience, income dependence, land tenure, lease rent, cultivation cost, farm size, expected yield, market price, satisfaction and production constraints. The dissertation methodology mentions cost-return analysis and the Benefit-Cost Ratio (BCR); however, the reported empirical tables available in the project do not provide a complete itemized output-value and net-return series from which a defensible BCR can be reproduced. Accordingly, this article does not invent a BCR. Profitability is discussed using the observed combination of cost brackets, expected yield, realized price and reported financial satisfaction.

5.3 Econometric model specification

In addition to the descriptive analysis, an Ordinary Least Squares (OLS) regression model is estimated to examine the factors associated with the scale of interstate ginger cultivation among Wayanad-origin farmers operating in Karnataka. All respondents in the survey have already shifted their ginger cultivation activity to Karnataka. Consequently, the data do not contain a non-migrant comparison group and cannot support a binary logit or probit model of the original decision to shift. The regression therefore uses the natural logarithm of the area currently cultivated under ginger in Karnataka as the dependent variable, treating cultivated acreage as an indicator of the intensity or scale of interstate cultivation.

The estimated specification is: $\ln(\text{AREA}_i) = \beta_0 + \beta_1 \text{AGE}_i + \beta_2 \text{EXP}_i + \beta_3 \text{INC}_i + \beta_4 \text{PRIMARY}_i + \beta_5 \text{LEASE}_i + \beta_6 \text{COST}_i + \beta_7 \text{YIELD}_i + \beta_8 \text{PRICE}_i + \beta_9 \text{LABOUR}_i + \beta_{10} \text{SAT}_i + \beta_{11} \text{TRAIN}_i + \varepsilon_i$. AGE is the respondent's age in years; EXP is an ordered farming-experience category; INC is an ordered annual family-income category; PRIMARY is a dummy variable indicating whether ginger is the primary source of household income; LEASE is annual lease rent per acre; COST is cultivation cost per acre; YIELD is expected 60-kg bags per acre; PRICE is the reported market price per quintal; LABOUR indicates reported difficulty in finding workers; SAT is an ordered measure of financial satisfaction; and TRAIN indicates receipt of modern ginger-cultivation training. Grouped numerical responses are represented by their category mid-points where necessary. Heteroskedasticity-robust (HC3) standard errors are reported. The coefficients are interpreted as associations with cultivation scale and not as causal effects on the original decision to move cultivation from Wayanad to Karnataka.

VI. RESULTS AND DISCUSSION

6.1 Profile of interstate ginger farmers

The age and experience structure indicates that interstate ginger cultivation is mainly managed by mature farmers rather than new entrants. Seventy-nine per cent of respondents are aged 45 years and above, while 67 per cent have more than five years of experience in ginger farming. The largest experience group is 5-10 years (46 per cent), followed by less than five years (32 per cent), 10-15 years (19 per cent), and more than 15 years (3 per cent). This concentration of experienced cultivators is important because ginger requires knowledge of seed selection, disease management, drainage, timing of input application and market conditions. The movement to Karnataka therefore appears to involve the geographical transfer of specialized farming knowledge accumulated in Wayanad.

The livelihood dependence on ginger is also high. Seventy-eight per cent report ginger cultivation as their primary source of income, and 92 per cent of households have annual family income above ₹10 lakh according to the project findings. This does not mean that ginger is a low-risk activity. Rather, it suggests that commercial-scale ginger can generate large gross income flows while also requiring large working capital. The financial position of these households must therefore be interpreted together with their exposure to high cultivation cost and market risk.

Indicator	Category / result	Share of respondents
Age	45 years and above	79%
Ginger farming experience	More than 5 years	67%
Education	Secondary level or above	96%
Primary income source	Ginger cultivation	78%
Land tenure	Leased land	99%
Cultivation scale	5 acres or more	54%

(Source: Primary Data)

6.2 Geography of cultivation and land access

The survey records a wide spatial spread within Karnataka. Mysuru accounts for 22 per cent of respondents, Nanjangud 19 per cent, Kodagu 15 per cent, Gundlupete 11 per cent, H.D. Kote and Shivamogga 8 per cent each, Hassan 6 per cent, and smaller shares are reported in Periyapatna, Siddapura, Hunsur and Chikkamagaluru. The concentration near the Kerala-Karnataka border reflects geographical proximity, road connectivity and established farmer networks. Such networks reduce information costs related to land identification, labour recruitment, input purchase, crop supervision and marketing.

Land access emerges as the strongest structural explanation for migration. Ninety-nine per cent of respondents state that obtaining large plots on lease is much easier in Karnataka than in Wayanad. Similarly, 99 per cent cultivate leased rather than owned land. This indicates that the interstate production system is essentially a lease-based commercial farming model. Wayanad's fragmented holdings limit the scope for contiguous expansion, whereas the availability of larger plots in Karnataka allows farmers to operate on a scale suitable for intensive commercial production. More than half of the respondents (54 per cent) cultivate five acres or more, including 22 per cent cultivating seven acres or above.

Lease access, however, has a high fixed cost. Eighty-five per cent of respondents pay between ₹1.0 lakh and ₹1.25 lakh per acre per year. This amount has to be committed before the crop outcome is known. It therefore increases the break-even requirement and makes access to working capital important. The practice can remain attractive because farmers avoid the much larger capital requirement of land purchase, but short-term or informal contracts can create tenure insecurity. A formal and transparent lease framework is therefore important for a farming system where almost the entire sample depends on rented land.

Land and location indicator	Survey result
Mysuru	22%
Nanjangud	19%
Kodagu	15%
Gundlupete	11%
Respondents on leased land	99%
Easier access to large, leased plots in Karnataka	99%
Annual lease rent of ₹1.0-1.25 lakh per acre	85%

(Source: Primary Data)

6.3 Cost structure and commercial scale

Ginger cultivation among the surveyed farmers is highly capital intensive. Forty per cent report total cultivation cost between ₹6 lakh and ₹7 lakh per acre, while 41 per cent report ₹7-8 lakh. A further 10 per cent is spent above 8 lakh and only 8 per cent remain below ₹6 lakh. Thus, 81 per cent incurs a total cost of ₹6-8 lakh per acre. These figures are consistent with the broader literature identifying seed rhizomes, labour and plant-protection expenditure as important cost components (Mathew et al., 2018). In the interstate model, rent lease and transport further add to the normal cultivation expenses.

The scale distribution reinforces the commercial nature of the activity. Thirty-two per cent cultivate 5-6 acres, 11 per cent cultivate 7-8 acres, and another 11 per cent cultivate 10 acres or more. Therefore, a substantial part of the sample is operating at a scale where total seasonal capital requirements can become very large. For example, even without calculating an exact average, a farmer cultivating five acres at a reported cost range of ₹6-8 lakh per acre is exposed to a seasonal cost of roughly ₹30-40 lakh. This simple implication shows why access to credit, price stability and disease control are central to the survival of the enterprise.

Economic indicator	Distribution / dominant result
Annual lease rent per acre	85% pay ₹1.0-1.25 lakh
Total cultivation cost per acre	81% spend ₹6-8 lakh
Farm size	54% cultivate 5 acres or more
Expected yield	81% expect 400-550 bags (60 kg) per acre
Realized market price	89% receive ₹5,500-7,000 per quintal
Financial satisfaction	89% satisfied or highly satisfied

(Source: Primary Data)

6.4 Yield, quality, price and perceived profitability

The main economic justification for high investment is the expectation of superior productivity. Ninety-eight per cent of respondents report that both harvest yield and ginger quality are much better in Karnataka than in Wayanad. Expected yield is concentrated between 400 and 550 sixty-kilogram bags per acre for 81 per cent of respondents. The largest group (31 per cent) expects 451-500 bags, while 27 per cent expects 400-450 bags and 23 per cent expects 501-550 bags. These results strongly support the view that farmers are moving not merely because land is available, but because they believe that the combination of new soils, drainage, climate and farm management can deliver superior crop performance.

Market prices are equally important. Eighty-nine per cent of respondent's report receiving between ₹5,500 and ₹7,000 per quintal. Within this range, 35 per cent fall between ₹5,500 and ₹6,000, 20 per cent between ₹6,001 and ₹6,500, and 34 per cent between ₹6,501 and ₹7,000. Only 4 per cent report prices above ₹7,000 and 6 per cent below ₹5,500. The concentration within a relatively broad price band indicates that profitability remains sensitive to the timing of sales, quality differences, trader relationships and seasonal market conditions.

Despite high costs and uncertainty, 89 per cent of respondents are satisfied or highly satisfied with financial returns: 65 per cent are satisfied and 24 per cent highly satisfied. This is an important subjective indicator because it reflects farmers' own assessment after taking account of the cost and risk they face. However, satisfaction should not be treated as a substitute for a complete farm-budget measure of net profit. The combination of high satisfaction, high expected yield and favourable reported prices indicates that

the interstate strategy is economically attractive to most respondents under current conditions, but it does not eliminate the possibility of severe losses in bad seasons. Münster (2015) similarly showed that ginger can produce substantial gains for some farmers while exposing others to debt and financial distress.

6.5 Regression results: factors associated with the scale of interstate cultivation

The regression is estimated using 98 usable observations. The incomplete questionnaire is not included, and one market-price response is omitted from the regression because it is not comparable with the price scale reported by the remaining respondents. The model has an R^2 of 0.641 and an adjusted R^2 of 0.595. The joint significance test is statistically significant ($F = 12.86$, $p < 0.001$), indicating that the explanatory variables, taken together, account for a substantial proportion of the observed variation in the scale of ginger cultivation in Karnataka.

Variable	Coefficient	Robust SE	p-value
Constant	-0.709	0.789	0.369
Age	0.0079	0.0066	0.236
Ginger-farming experience	0.0905	0.0780	0.246
Annual family income category	0.4826***	0.0737	<0.001
Ginger as primary income source	0.1536	0.1089	0.158
Lease rent per acre	0.0576	0.4073	0.888
Cultivation cost per acre	-0.0181	0.0246	0.461
Expected yield (60-kg bags/acre)	0.0015	0.0009	0.103
Market price per quintal	-0.00005	0.00008	0.521
Difficulty in finding labour	-0.1138	0.1002	0.256
Financial satisfaction	-0.0837	0.0517	0.106
Training received	-0.0656	0.1498	0.662
Observations	98		
R^2	0.641		
Adjusted R^2	0.595		

Note: Dependent variable = natural logarithm of acres under ginger cultivation in Karnataka. HC3 robust standard errors are reported. *** $p < 0.01$. Source: Primary survey data.

Annual family income is the only explanatory variable that is statistically significant at the conventional 1 per cent level. Its positive coefficient indicates that farmers in higher income categories tend to cultivate ginger on a larger scale in Karnataka, after controlling age, farming experience, lease rent, cultivation cost, expected yield, market price, labour conditions, financial satisfaction and training. This result is economically plausible because interstate ginger cultivation requires substantial working capital for land lease, seed, labour, crop protection, irrigation and transport. Higher-income farm households are therefore better placed to mobilize the capital required to operate larger leased holdings.

Expected yield has a positive coefficient, suggesting that larger-scale cultivators tend to report higher expected output, although the coefficient is not statistically significant at the 10 per cent level ($p = 0.103$). The remaining variables do not show statistically significant independent associations in this specification. This should not be interpreted as evidence that land access, yield advantage or other motivations are unimportant to the interstate shift. Several of the direct motivation variables exhibit very little variation within the sample: almost all respondents report easier access to large plots and better harvest and quality in Karnataka. Such near-unanimous responses are substantively important in the descriptive analysis but cannot explain differences in cultivated acreage in a multivariate regression. The variance inflation factors are below 2.4 for all regressors, suggesting no serious multicollinearity problem, and a Breusch-Pagan test does not indicate statistically significant heteroskedasticity ($p = 0.131$). Robust standard errors are nevertheless retained.

6.6 Production and marketing challenges

The most frequently identified single production problem is water supply or irrigation scarcity, reported by 24 per cent of respondents. Wild animal attacks are reported by 23 per cent, while rhizome rot is the principal problem for 14 per cent. Another 37 per cent place their difficulties under other or multiple combined challenges. The pattern shows that the constraints are not purely financial. Water, crop health and wildlife interaction directly affect output and can turn high capital investment into loss. Climate variability adds to this uncertainty because ginger requires adequate but well-drained moisture conditions. Kumar et al. (2025) therefore stress efficient irrigation, integrated pest management and more sustainable production systems as important responses to climate-related risks.

Marketing arrangements provide both support and vulnerability. Farmers have access to local markets, traders and commission agents, and the road network facilitates transport across Karnataka and Kerala. Traders can provide market information, transport and sometimes advance finance. At the same time, dependence on intermediaries can reduce the bargaining position of individual cultivators, especially when harvesting creates pressure for immediate sales. Limited scientific storage and value-addition capacity further constrain the ability to wait for a better price. Strengthening FPOs, collective marketing and real-time price information can reduce such disadvantages without removing the useful coordination role played by traders.

Major issue / response	Share
Irrigation / water scarcity as main challenge	24%
Wild animal attack / crop raiding	23%
Rhizome rot disease	14%
Other / multiple challenges	37%
Prefer integrated policy support package	51%

(Source: Primary Data).

VII. DISCUSSION

The findings show that interstate ginger cultivation should be understood as a farmer-led response to structural constraints in the home region. The most decisive factor is access to land. Nearly universal agreement that large plots are easier to lease in Karnataka, combined with the fact that 99 per cent of respondents farm leased land, demonstrates that the movement is closely related to the geography of land availability. The migration process allows farmers to overcome the physical limits of fragmented holdings in Wayanad without permanently relocating their households. It is therefore better described as mobility of cultivation rather than conventional labour migration.

At the same time, this land strategy is inseparable from financial risk. High lease rent, high cultivation cost and the commercial scale of operations create large seasonal capital requirements. Farmers accept this exposure because they expect better yield and quality and because market prices can generate attractive revenue. In this sense, the survey results confirm the continuing relevance of Münster's (2015) argument that ginger combines opportunity with uncertainty. The present evidence, however, also shows a relatively high level of farmer satisfaction. This suggests that experienced cultivators have developed production knowledge, social networks and market linkages that allow many of them to manage the risks successfully under favourable seasons.

The results further indicate that natural-resource conditions are central to the movement. Farmers' near-unanimous perception of better yield and quality suggests that fresh or less exhausted soils and favourable growing conditions are important pull factors. Yet repeated movement to new land can also create environmental problems if intensive chemical use, short lease horizons and weak responsibility for long-term soil health encourage extractive cultivation. The economic logic of temporary leasing may therefore conflict with soil conservation unless farmers, landowners and public agencies establish stronger incentives for sustainable management.

Finally, the study points to an institutional gap. Interstate farmers operate across administrative boundaries, while agricultural credit, crop insurance, extension services, lease regulation and market support are generally organized within states. This creates a mismatch between the mobility of production and the territorial structure of agricultural policy. A farmer residing in Kerala but cultivating leased land in Karnataka may face difficulties in proving tenancy, accessing local schemes, obtaining crop insurance or resolving land-related disputes. The sustainability of the system therefore depends not only on agronomy and prices but also on institutional arrangements that recognize interstate cultivators as a distinct category of commercial farmers.

VIII. POLICY IMPLICATIONS AND SUGGESTIONS

First, legally valid and transparent lease agreements should be encouraged. Since almost all respondents cultivate leased land, written contracts specifying duration, rent, water access, responsibilities for soil management and dispute resolution would improve tenure security for both farmers and landowners. State agricultural departments can prepare simple model lease formats and farmer facilitation mechanisms without converting temporary lease arrangements into ownership disputes.

Second, institutional finance and crop insurance need to be adapted to the interstate nature of cultivation. High seasonal investment makes dependence on informal credit risky. Banks and cooperative institutions may consider working-capital products based on verified lease agreements, crop plans and group guarantees. Insurance products should explicitly recognize leased and interstate cultivation and cover important risks such as rhizome disease, extreme rainfall, drought and other crop losses.

Third, production support should focus on irrigation, disease management and soil health. Expansion of efficient irrigation systems, drainage improvement, regular soil testing, disease-free seed material and integrated pest management would directly address the major agronomic risks reported in the survey. Extension agencies in Kerala and Karnataka can jointly conduct training programmes for migrant cultivators, particularly on rhizome rot management, balanced nutrient use and environmentally safe crop protection.

Fourth, collective marketing institutions should be strengthened. Farmer Producer Organizations can aggregate output, negotiate with traders, arrange transport, create grading and storage facilities and disseminate real-time market information. Digital price information can reduce information asymmetry, but physical infrastructure remains equally important. Storage and cold-chain facilities where technically suitable, cleaning, grading and primary processing can reduce distress sales and improve quality-based price realization.

Fifth, value addition should receive greater attention. Fresh ginger is perishable and price sensitive. Dry ginger, powder, paste, oil, oleoresin, candy and other processed products provide alternative outlets and can distribute marketing risk. Investment in small and medium processing units near production clusters could generate local employment and allow farmers to capture a larger share of the final value. Finally, coordination between the Governments of Kerala and Karnataka would help address legal, technical and welfare issues faced by farmers whose residence and cultivation locations lie in different states.

IX. LIMITATIONS OF THE STUDY

Studying has four important limitations. First, purposive sampling was used to identify a specialized and mobile population of Wayanad-origin ginger farmers; the findings should therefore not be generalized to all ginger farmers in Karnataka or Kerala. Second, the sample size is limited to 100 respondents and represents selected cultivation locations. Third, several economic indicators are reported as grouped ranges rather than exact farm accounts. This limits the calculation of precise mean cost, gross return, net return and BCR. Fourth, the survey captures farmers' perceptions of comparative yield and quality and does not independently measure soil fertility or crop quality. These limitations do not reduce the relevance of the observed patterns, but they indicate the need for a future panel survey with detailed farm accounts and plot-level agronomic data.

X. CONCLUSION

The shift of ginger cultivation from Wayanad to Karnataka is an important example of how farmers adapt to land constraints, changing production conditions and commercial opportunities. The evidence from 100 Wayanad-origin cultivators shows that the movement is dominated by experienced farmers and is strongly dependent on leased land. The most powerful pull factor is the availability of larger plots, while better perceived yield and quality provide a clear production advantage. The system is

commercially oriented: more than half of the respondents cultivate at least five acres, and most incur costs of ₹6-8 lakh per acre. Favourable expected yields and market prices explain why a large majority remain satisfied with the financial outcome.

Econometric analysis adds an important qualification to these descriptive findings. Since the survey contains only farmers who have already shifted cultivation to Karnataka, the regression does not estimate the probability of migration itself. Instead, it explains differences in the scale of interstate cultivation among these farmers. The model explains about 64 per cent of the variation in log cultivated acreage, and annual family income emerges as the only statistically significant positive predictor. This indicates that the capacity to mobilize household financial resources is closely associated with operating larger ginger holdings in Karnataka. Expected yield is positively associated with cultivation scale but does not reach conventional levels of statistical significance. The near-unanimous responses on easier access to large plots and better yield and quality remain important descriptive evidence of the motives for shifting, even though their limited variation prevents them from functioning as useful regressors.

However, the economic opportunity is accompanied by substantial risk. High upfront costs, short-term lease arrangements, irrigation scarcity, wildlife damage, rhizome rot, climate variability and price fluctuations can threaten profitability. Dependence on intermediaries and limited access to formal credit, insurance and organized marketing further increase vulnerability. The regression result on household income reinforces the importance of finance: farmers with greater financial capacity are better able to operate at larger scale, while resource-constrained cultivators may face greater difficulty in meeting the working-capital requirements of this high-cost crop. Therefore, the continued expansion of interstate ginger cultivation should not be viewed only as evidence of profitability. It also signals the need for policy institutions capable of supporting a mobile agricultural economy.

A sustainable future for this farming system requires formal lease security, suitable credit and insurance, effective extension support, irrigation and disease management, stronger FPOs, better market information, value addition and improved soil stewardship. The larger lesson is that farmer mobility can be an effective livelihood strategy when markets and natural resources permit, but its long-term success depends on institutions that reduce risk, widen access to working capital and prevent short-term commercial gains from producing long-term ecological costs.

REFERENCES

1. Kumar, R. P., Kumar, S. R., Mohanraj, K., & Anbarasan, P. (2025). Ginger cultivation in India: Impact of climate change and sustainability strategies—A potential review. *Cogent Food & Agriculture*, 11(1), 2446653. <https://doi.org/10.1080/23311932.2024.2446653>
2. Mathew, M., Vani, N., & Aparna, B. (2018). Economics of production of ginger in Wayanad district of Kerala, India. *Economic Affairs*, 63(3), 627–632. <https://doi.org/10.30954/0424-2513.3.2018.6>
3. Mmasa, J. J., & Mhagama, J. K. (2017). Social-economic factors influencing ginger (*Zingiber officinale*) productivity among smallholder growers in Tanzania: Case of Same District. *Journal of Economics and Sustainable Development*, 8(8), 12–20.
4. Münster, D. (2015). ‘Ginger is a gamble’: Crop booms, rural uncertainty, and the neoliberalization of agriculture in South India. *Focaal—Journal of Global and Historical Anthropology*, 2015(71), 100–113. <https://doi.org/10.3167/fcl.2015.710109>
5. Nair, K. P. P. (2019). Turmeric (*Curcuma longa* L.) and ginger (*Zingiber officinale* Rosc.)—World’s invaluable medicinal spices: The agronomy and economy of turmeric and ginger. Springer. <https://doi.org/10.1007/978-3-030-29189-1>
6. Subba, S., Jahanara, & Bala, N. (2021). Sustainability and profitability of organic ginger growers in South District of Sikkim. *International Journal of Advances in Agricultural Science and Technology*, 8(8).
7. Sundresha, B. R., Nanjappa, D., Vinay Kumar, R., & Lakshmi Narayan, M. T. (2020). A study on knowledge level of ginger growers on improved cultivation practices in Hassan district, India. *International Journal of Current Microbiology and Applied Sciences*, 9(7), 3014–3021. <https://doi.org/10.20546/ijcmas.2020.907.354>
8. Asha, S., & Maurya, M. K. (2020). Production and marketing of ginger in Bidar district of Karnataka. [Publication details as reported in the original project bibliography].
9. Balamatti, A., & Divya, H. V. (2016). A study on the socio-economic and environmental impact of ginger cultivation in Mysuru district. [Publication details as reported in the original project bibliography].
10. Gali, B., & Reddy, R. (2024). Growth and instability of ginger cultivation in Karnataka with special reference to Bidar district. [Publication details as reported in the original project bibliography].
11. Pesala, P., & Maruthi, I. (2021). Socio-economic characteristics of ginger farmers in Karnataka. [Publication details as reported in the original project bibliography].
12. Savan, B. P. (2013). Production, marketing and export trade of ginger in Karnataka with special reference to Chikmagalur district.

Copyright & License:



© Authors retain the copyright of this article. This work is published under the Creative Commons Attribution 4.0 International License (CC BY 4.0), permitting unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.