



Exploring Sustainability and Constraints in Organic Ginger Farming: A Case Study of Thayong, Manipur

Abstract: The study investigates the sustainable agricultural methods, obstacles encountered by organic farmers, and the potential growth of organic ginger farming in the Thayong area of Manipur. In Thayong, it has been identified that there are 150 ginger farmers growing two varieties of ginger: local ginger and Nadia ginger. These ginger crops are also interplanted with pineapples. To gather insights from the ginger farmers, both interviews and observational methods were utilized. The study highlights several challenges faced by the farmers, including pest and fungal issues, the high cost of organic fertilizers, and deteriorating soil fertility due to Jhum or shifting cultivation. Despite these challenges, the demand for organic ginger is consistently rising, presenting an opportunity for increased production and export. This research recommends that the relevant departments and government agencies offer targeted assistance by providing subsidies for fertilizers and pesticides, conducting regular monitoring of organic ginger farmers to address pest and fungal issues, and critically, expanding land allocations for organic ginger farming. Such measures could boost opportunities in both local and international markets for organic ginger. The dynamics of organic ginger farming in Thayong could be further enhanced by establishing a reliable market channel. Furthermore, the method of cultivating organic ginger in Thayong represents a commendable effort towards sustainable agricultural practices and a healthier environment. Most importantly, the research aims to elevate the standard of organic ginger farming in the state.

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Article History:

Received Date : Aug 16, 2025

Revised Date : Sep 03, 2025

Accepted Date : Sep 03, 2025

Published Date : Sep 19, 2025

Keywords: *Organic ginger cultivation, sustainable farming practices, economic challenges, Thayong region, Manipur.*

1.Introduction:

Recently, there has been considerable interest in organic farming because of its ability to reduce the adverse effects of traditional agriculture on the environment and human health. Among the various crops cultivated organically, ginger has become one of the most prized and sought-after spices worldwide. In a country like India, ginger cultivation not only bolsters the agricultural industry but also significantly contributes to the livelihoods of smallholder farmers. Organic ginger farming in Thayong region of Manipur is not an exception. In

particular, ginger growing in the region is crucial, as local farmers are increasingly adopting organic methods to preserve their land and boost their earnings. However, organic ginger farming comes with its own set of challenges and opportunities. On one side, implementing sustainable farming techniques can improve soil health, decrease reliance on artificial fertilizers and pesticides, and command higher market prices for premium quality produce. Conversely, organic farming demands considerable labour, expertise, and resources, and is also faced with economic challenges such as elevated production costs, restricted market access, and erratic weather patterns. These financial obstacles often put pressure on farmers' capacity to uphold sustainable practices, leading to a challenging equilibrium between profitability and ecological responsibility. This study seeks to explore the sustainable methods used by ginger farmers in Thayong, assess the economic difficulties they faced, and pinpoint strategies to assist them in overcoming these issues. By analyzing the connection between sustainability and economic feasibility in organic ginger cultivation, this research aims to provide valuable perspectives for farmers, policymakers, and stakeholders focused on advancing sustainable agriculture in the region. In the end, the objective is to enhance the understanding of how ginger farmers in Thayong can succeed in an

organic farming environment while tackling both environmental and financial issues.

Objectives

1. To assess the sustainable farming practices adopted by ginger farmers in Thayong: Investigate the techniques and methods used by farmers to cultivate organic ginger while maintaining environmental sustainability.
2. To identify the economic challenges faced by ginger farmers in Thayong: Analyze the financial difficulties, market conditions, and resource constraints that impact the profitability and long-term viability of organic ginger farming.
3. To recommend strategies for overcoming economic challenges in organic ginger farming: Provide practical recommendations for improving the economic conditions of farmers through policy interventions, better market access, and improved farming practices.

2.Literature Review

The research carried out by Dr. Sharath A.M (2015) emphasizes that organic farming is governed by international standards, which enhances biodiversity and ecological balance by minimizing the reliance on external inputs. Ginger, a significant export for India, flourishes in well-drained loamy soil that is high in humus content. Because ginger depletes soil nutrients, it is advised not to plant it continuously in the same location. As a result, it is suggested to transition the entire farm to organic practices, integrating ginger into crop rotations to promote sustainability and improve soil health.

Chubakumzuk Jamir (2022) in his research on organic ginger production in Longleng (Nagaland) highlights the profitability of the crop, with a Benefit-Cost Ratio (BCR) of 1.75. The major cost in production is seed, which accounts for 65.1% of expenses. Key factors influencing production include seed, labour, and crop rotation years. However, farmers face challenges such as lack of finance, inadequate farm inputs, high labour costs, and limited storage facilities. The study suggests that ginger farming can be a sustainable and profitable enterprise if there is increased investment, subsidized farm inputs, and

affordable loans for smallholder farmers. It also calls for policy interventions to address these constraints and promote market-oriented organic ginger farming.

A study conducted by P. Sial (2017) in the Koraput district of Odisha evaluated the cultivation of ginger using organic versus inorganic methods under the National Horticulture Mission. It revealed that organic ginger (variety Suprabha) had a yield of 70.4 quintals per hectare, which was slightly lower compared to the 76.0 quintals achieved from inorganic farming. However, organic farming was associated with a reduced production cost (Rs. 233,600 per hectare versus Rs. 235,600 per hectare) and generated greater gross returns (Rs. 563,200 as opposed to Rs. 532,000). The net profit from organic ginger was Rs. 329,600, exceeding the Rs. 296,400 net profit from inorganic ginger. Additionally, the Benefit-Cost ratio for organic farming was more favorable (1:2.41 compared to 1:2.26), highlighting its economic advantages and promoting its adoption by farmers.

A case study of Shri Nim Tshering Lepcha, a 56-year-old farmer from Lower Nandok, East Sikkim, who has successfully adopted organic ginger cultivation with the help of ICAR-KVK, East Sikkim, also pinpoint the success of organic ginger farming. Initially facing challenges like lack of quality planting materials and technical knowledge, he received 200 kg of high-quality ginger rhizomes in 2013-14 and was trained in organic ginger farming. By 2017-18, he expanded his cultivation to one hectare, achieving an average yield of 137.13 quintals per hectare, with net returns of Rs. 2,84,905/ha and a B:C ratio of 3.28. His success has inspired other farmers in his village, and ginger has become a key economic crop in Nandok and neighboring villages, with over 50 hectares now dedicated to ginger cultivation. The technology has proven highly profitable, leading to widespread adoption among local farmers, with some, like Mr. Phurba Lepcha, even producing high-quality ginger seeds for local demand.

The research conducted by Minjeong Kim (2024) examined environmentally friendly techniques to enhance ginger farming by applying organic treatments to two ginger types (Bongdongjaerae and Laiwu xiao). It investigated the impact of lime-sulfur mixtures, antifungal bacteria

(*Bacillus velezensis*), and microalga (*Chlorella fusca*) on germination rates, growth, and resistance to disease. The findings indicated that a 0.4% lime-sulfur application resulted in the highest rate of germination, while the combination of *Bacillus velezensis* and *Chlorella fusca* significantly increased fresh weight. Single-bed cultivation surpassed flat-bed cultivation in terms of both growth and disease management. In summary, the organic treatments demonstrated effectiveness in enhancing ginger growth and minimizing disease, thereby promoting sustainable agricultural practices.

P. Srinivas and B. Mahender (2025) conducted a two-year study (2019-2021) to evaluate organic farming methods for ginger cultivation at the Turmeric Research Station, Kammarpally. The experiment compared three ginger varieties (Nadia, Maran, and Local) using organic versus inorganic farming techniques. Organic inputs like PGPR (GRB-35), FYM, neem cake, Vermicompost, sulphate of potash, and IISR-ginger booster were used. The results showed that the Maran variety (V2) had the highest yield (20.72 tons/ha) under organic cultivation. Organic methods also led to improved plant growth, with better plant height, number of shoots, shoot height, leaf length, leaf width, and leaf petiole length compared to inorganic methods. The study highlighted the benefits of organic farming in enhancing both productivity and sustainability in ginger cultivation.

3. Materials and methods

The study was conducted in the Thayong region of Manipur, which has 150 ginger farmers out of which 100 Farmers are randomly selected for the study. The land is community land. The population consists of a 50:50 split between male and female farmers. The total cultivated area for ginger farming is approximately 200 hectares, with each farmer owning more than 1-1.5 hectare. The research methodology for the ginger farming study in Thayong involved a combination of quantitative and qualitative approaches. Data was collected through interviews and observations of farming practices, including ginger types, cultivation methods, labour costs, and marketing routes. Information on ginger prices, types of ginger

grown (Local Ginger and Nadia Ginger), cultivation practices, fertilizer use, and marketing routes was gathered to understand the entire production process.

4. Results and Discussion

Demographical and Geographical Data of Thayong

Thayong is a village which is located in Sadar Hills Subdivision in Senapati District of Manipur. The distance between Thayong and Senapati Headquarter is 86 km. The population in Thayong village is 680 out of which population of male is 339 and that of women is 341 (Census 2011). In 2024 it rose to around 1200 with 198 households (E-Pao.Net, 13 August 2025).

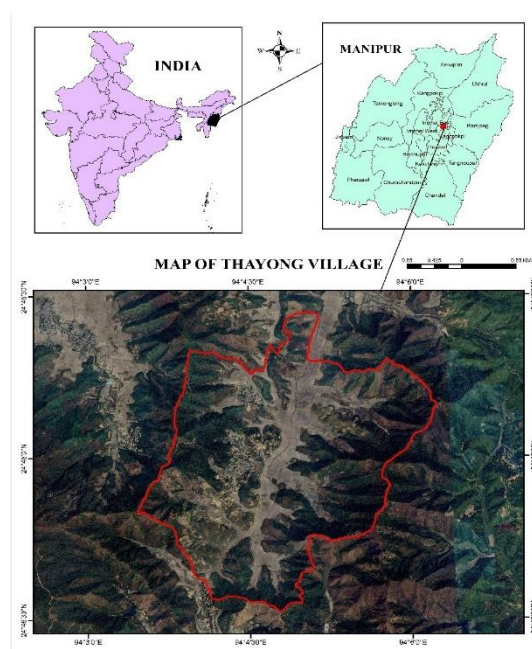


Figure 1. Thayong Map

Table No.1 Gender Distribution of Ginger Farmers in Thayong

Gender	Number of Farmers	Percentage
Male	75	50%
Female	75	50%
Total	150	100%

Source: Primary Data collected by the researcher from the field visits.

Table No.2 Overview of Community Land and Land Allocation in Thayong

Parameter	Description
Land Ownership Structure	Community -Owned Land
Land Allocation Method	Informally Distributed among farmers under traditional system
Farming Practices	Primarily Ginger Cultivation
Average land per farmer	>1 hectare

Source: Primary Data collected by the researcher from the field visits.

Farming Practices and Intercropping with Pineapples

Ginger farming in Thayong is integrated with intercropping, where ginger is cultivated alongside pineapples. This farming practice offers several benefits. Intercropping helps to maximize land use, as farmers can grow two types of crops on the same piece of land, improving overall productivity. Pineapples, with their deep roots, help reduce soil erosion, and their presence may also provide an additional income stream for farmers. This combination of crops may help balance the ecological system of the land and provide a more resilient farming strategy in the face of potential pest issues or soil degradation. However, managing intercropping requires careful attention to ensure that both crops are supported adequately and do not compete for nutrients or space in a way that negatively affects either one.

Sustainable Farming Practices of Ginger

Ginger cultivation in Thayong follows a well-defined seasonal cycle, with ginger being sown between March and April and harvested in November. Two primary varieties are cultivated—Local Ginger and Nadia Ginger—each with its own distinct yield characteristics, with Local Ginger producing about 8,000 kg per acre and Nadia Ginger yielding around 10,000 kg per acre. The farming process is labour-intensive,

beginning with plowing, which is essential for preparing the land, followed by a month-long weeding period requiring the hiring of five to six labourers. The cost of labour is a significant expense, with daily wages for each labourer set at 400 rupees. Additionally, maintaining soil fertility and pest management are crucial components of ginger farming in the region. Farmers rely on organic inputs, such as cow dung mixed with wai (a local material), and neem cakes to control pests and fungi affecting the ginger roots. These organic practices are aligned with the region's emphasis on sustainable farming. Seed sourcing is also split between self-saved seeds—making up 40% of the required seeds per hectare—and the remaining 60% purchased from Organic Outlet, ensuring a steady supply of high-quality seeds for the next planting cycle. The combination of traditional farming methods and organic practices underlines the region's commitment to growing high-quality ginger while navigating the challenges of maintaining soil health and pest control.

The marketing of organic ginger in Thayong is primarily conducted through local markets and collection by MOMA (Marketing and Organic Movement Association). Farmers supply their ginger to local bazaars, such as Lamlong Bazaar in Imphal East and Uripok Bazaar in Imphal West, where they sell directly to consumers. For freshly harvested ginger, the price is typically set at Rs. 50 per kilogram, while older ginger, which has been stored for a longer period, is priced higher at Rs. 80 per kilogram. Despite the organic nature of the ginger, there is no price differentiation between organic and conventional ginger, which presents a challenge for farmers trying to maximize the value of their organic produce. However, farmers begin to generate revenue in the second year of cultivation, as ginger takes time to mature and reach optimal harvest levels. The existing marketing routes ensure that farmers have access to local demand, but the lack of a distinct price premium for organic ginger may limit the full economic potential of organic farming in the region. This situation suggests a need for greater recognition and support for organic products, potentially through certifications, subsidies, or direct-to-consumer sales channels to help farmers achieve better prices for their organic produce.

Table 3: Marketing Channels and Price Structure of Organic Ginger in Thayong

Aspect	Details
Primary Marketing Channels	- Local markets (e.g., Lamlong Bazaar, Uripok Bazaar) - MOMA collection system
Sales Method	- Direct-to-consumer at bazaars - Collection by MOMA for distribution
Pricing Structure	- Fresh ginger: Rs. 50/kg - Stored/older ginger: Rs. 80/kg
Price Differentiation	No premium for organic ginger compared to conventional varieties
Revenue Timeline	Farmers begin earning from the second year of cultivation
Challenges Identified	- Lack of price premium for organic produce - Limited consumer awareness of organic benefits
Opportunities for Improvement	- Certification programs for organic produce - Direct-to-consumer platforms - Government or NGO subsidies/support
Local Demand Access	Adequately served through local bazaars and MOMA network
Economic Limitation	Absence of organic labeling reduces potential income

Source: Primary Data collected by the researcher from the field visits.

5. Challenges and Financial Constraints faced by Ginger farmers

1. Expenses Related to Organic Fertilizers and Pesticides

One of the main economic challenges ginger farmers in Thayong encounter is the costly nature of organic fertilizers and pesticides. Farmers depend on organic fertilizers, crucial for sustaining soil fertility and promoting ginger development. MOMA sells each 50 lb bag of organic fertilizer for Rs. 2500. Given that ginger

cultivation demands a substantial quantity of fertilizer (particularly as the land has been subjected to Jhum cultivation, resulting in nutrient deficiency), the steep price of these inputs poses a significant financial strain for farmers. As these fertilizers can be difficult to afford, farmers feel the pressure to strike a balance between costs and productivity.

Furthermore, neem cakes and neem oil are utilized to control pests and fungi. The cumulative costs of these inputs can quickly accumulate, further increasing the total expense of ginger farming. Farmers have voiced their need for more cost-effective and accessible pest and fungal control solutions to alleviate the overall financial burden of the cultivation process.

2. Daily Labour Expenses for Weeding and Other Activities

Labour represents another major cost in ginger farming. For labour-intensive tasks like weeding, which last a month after planting, farmers employ five to six workers at a daily wage of Rs.400. Consequently, over a single month dedicated to weeding, farmers incur considerable labour costs, which can amount to a significant portion of their total expenses throughout the entire farming cycle.

Considering ginger is cultivated on extensive areas (with 150 farmers managing 200 hectares of land), the cost of labour for activities such as weeding, harvesting, and maintenance work plays a significant role in the economic calculations. In areas where labour is either scarce or costly, this challenge becomes even more pronounced, adding to the financial burden on farmers.

3. Financial Strain of Preserving Soil Fertility

Soil fertility presents a crucial challenge in ginger farming, especially since the region practices Jhum cultivation. Jhum involves slash-and-burn techniques, which gradually deplete soil fertility. As a result, it becomes essential to focus on maintaining soil health. Without sufficient organic matter or effective soil management practices, the soil may lose productivity and become more vulnerable to erosion. The necessity to restore soil fertility through the use of external inputs like organic fertilizers,



compost, and green manure further intensifies the financial burden.

Moreover, if soil quality continues to decline, farmers risk experiencing lower yields, which would directly influence their income. The responsibility of maintaining soil fertility represents not only an economic challenge for individual farmers but also a systemic issue that could impact the entire ginger farming community if left unaddressed.

4. Economic Viability of Ginger Farming

The combined effects of high input expenses (fertilizers, pesticides, and labour), soil deterioration, and the duration for ginger to start producing income (which begins only in the second year) can hinder farmers' ability to maintain long-term economic viability. Ginger farming necessitates substantial initial investments in labour, land preparation, and fertilizers, with the promise of returns not realized until the second year after planting.

For many farmers, this situation requires them to secure loans or utilize savings to manage these upfront costs, potentially placing them in financial jeopardy. If yields fall short of expectations or if external factors (such as climate variances or pest infestations) negatively impact the crop, the financial pressure can escalate. Additionally, the market prices for ginger fluctuate between freshly harvested (Rs. 50 per kg) and older ginger (Rs. 80 per kg), which may not consistently correspond with the incurred costs.

5. Pest and Fungal Challenges

The primary issue faced by Ginger farmers in Thayong is the infestation of pests and fungi, which significantly impact both the yield and quality of the Ginger. One type of fungal problem is root rot caused by fungi known as *Rhizoctonia* and *Pythium*, which can hinder the growth and yield of Ginger. The Ginger fields in Thayong are particularly susceptible to attacks from pests and fungi due to the poor soil fertility associated with Jhum cultivation practiced by farmers. This form of cultivation leads to soil degradation. As the yield diminishes due to pest and fungal challenges, the farmers' income also suffers.

Rising cultivation costs from frequent use of neem oil and cakes is another challenge. The infestations of pests and fungal issues can be mitigated through the application of neem oil and the use of neem cakes during Ginger cultivation. However, this control is only partially effective. In instances of severe pest and fungal problems, these treatments need to be applied more frequently, which results in increased costs for cultivation and higher labour inputs.

Ginger farmers frequently face outbreaks of pests and fungi. Consequently, they appeal to stakeholders, NGOs, agricultural extension services, and government agencies for enhanced training and awareness programs, greater availability of resources, and, most crucially, alternative methods to manage pest and fungal problems.

In summary, farmers require special focus on pest management through easy access to affordable pest control products, the development of research and projects aimed at creating pest-resistant Ginger varieties, and training workshops that emphasize the timely application of pest control measures.

6. Soil Fertility and Environmental Concerns

Farmers growing organic ginger in the Thayong region are facing significant challenges related to environmental issues and soil fertility. The nutrients in the soil begin to diminish due to Jhum cultivation, a method that involves slash-and-burn techniques. This form of farming makes the land more susceptible to soil erosion. The long-term productivity is compromised by this cultivation practice, resulting in decreased yields. Therefore, implementing alternative methods such as crop rotation, mulching, and the use of organic compost can be beneficial. These practices could aid in restoring soil nutrients, enhancing soil fertility.

7. Opportunities for expansion and export potential

Since, people have become more aware of the health benefit of organic foods nowadays, they have steered their demand for inorganic foods or vegetables to organic foods. These might be because of the various diseases which is a consequence of consuming inorganic foods which use chemical fertilizers and pesticides.



And also, Ginger is needed for daily consumption and besides, its medicinal properties.

Stakeholders such as agricultural organizations, government bodies, and NGOs can play a pivotal role in this expansion by investing in infrastructure, promoting the region's organic ginger, and helping farmers meet international certification standards. With the right support and investment, the region has significant potential to become a major exporter of organic ginger, thus improving the livelihoods of local farmers while meeting the growing global demand for organic products.

6. Summary of Findings and Key Recommendations

The analysis of ginger cultivation in Thayong indicates both challenges and prospects for local growers. Various findings points to the facts that ginger farming in Thayong, primarily organic and centered on community-owned land, faces several challenges despite growing demand, including high costs of organic inputs (fertilizers and pesticides), pest and fungal issues, labour-intensive practices, and soil degradation due to Jhum cultivation. To support farmers and boost productivity, stakeholders such as government agencies and NGOs should provide financial aid for inputs, expand land allocation for organic farming, invest in soil health through sustainable practices, and offer training in pest management and farming techniques. Additionally, efforts to open up export markets and improve certification access could enhance profitability and long-term sustainability in the region.

In spite of these difficulties, the region possesses significant growth potential, especially in increasing organic ginger output to fulfill local and international market needs. However, realizing this growth necessitates support from stakeholders to address the economic, environmental, and technical issues that farmers encounter.

7. Conclusion

If the ginger farmers in Thayong receive support from stakeholders, organic ginger farming in Thayong appears to have a bright future. As the worldwide demand for organic products keeps rising, their capability to boost production and broaden their international market grows. To

transform this potential into reality, an effective strategy must be developed to address the current challenges, such as the high costs of inputs, soil quality degradation, and the management of pests and diseases. When ginger farmers receive the appropriate guidance and support, the region has the potential to become a leading producer and exporter of organic ginger, which would improve the livelihoods of local farmers and bolster economic growth in the area. To ensure a sustainable and profitable future for organic ginger cultivation in the region, it is essential for all stakeholders to work together.

8. Conflict of Interest Statement: The authors declare no conflict of interest concerning this manuscript.

9. References

- [1] Ali, B. H., Blunden, G., & Tanira, M. O. (2008). Some phytochemical, pharmacological and toxicological properties of ginger (*Zingiber officinale* Roscoe) : A review of recent research. *Food and Chemical Toxicology*, 46, 409–422. <https://doi.org/10.1016/j.fct.2007.09.085>
- [2] Chhetri, P., & Gudade, B. A. (2013). Organic production of ginger : A prominent sub-Himalayan spice. *Popular Kheti*, 1(4), 207–210.
- [3] E-Pao.Net. (2025, August 13). <https://e-pao.net/GP.asp?src=29..180524.may24#:~:text=The%20AMWJU%20team%20led%20by,and%20Vermicompost%20for%20growing%20pineapple>
- [4] Jamir, C. (2022, July). Economic analysis of organic ginger farming in Longleng District: A case study Pongo, Yongnyah, Yongam and Bhumnyu village. Yingli College Longleng. <https://www.researchgate.net>
- [5] Kim, M., Shim, C., & Lee, J. (2024). Effects of organic agricultural materials and cultivation methods on the control of ginger rhizome rot disease and growth in organic ginger farming. *Agronomy*.
- [6] North Eastern Council. (2015). Basic statistics of NER, 2015. <http://necouncil.gov.in/sites/default/files/upload%20files/BasicStatistic2015-min.pdf>
- [7] Poudel, R. R., Regmi, P. P., Thapa, R. B., GC, Y. D., & KC, D. B. (2017). Economic analysis of ginger cultivation in selected locations of Nepal. *Bangladesh Journal of Agricultural Research*, 42(4), 681–691. <https://www.researchgate.net/publication/321086413>
- [8] Sharath, A. M. (2015, November). Organic farming in India: A study of ginger cultivation.
- [9] Stirling, G. R., & Nikulin, A. (1998). Crop rotation, organic amendments and nematicides for control of root knot nematodes (*Meloidogyne incognita*) on ginger. *Australasian Plant Pathology*, 27, 234–243. <https://doi.org/10.1071/AP98030>
- [10] Timsina, K. P. (2010). Economics of ginger production: A case study of Makawanpur district, Nepal. *Journal of the Institute of Agriculture and Animal Sciences*, 31–32, 35–41.



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- [11] Veeresh, G. K. (1999). Organic farming: Ecologically sound and economically sustainable. *Plant Horticultural Tech*, 1(Nov-Dec).
- [12] Vijayan, A. K., Gudade, B. A., Gautam, A., Deka, T. N., Bora, S. S., Dhanapal, K., & Remashree, A. B. (n.d.). Cultivation of ginger in Sikkim under an organic system. *Web of Science*.