



# Preserving Lakadong Turmeric: The Fight Against Emerging Threats

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## ABSTRACT

Nestled in the pristine hills of Meghalaya, Lakadong turmeric stands as one of the finest and most potent turmeric varieties in the world. Known for its exceptionally high curcumin content (6.8-7.5%) of its rhizomes, which gives it powerful medicinal and anti-inflammatory properties, this golden spice has long been a source of livelihood for local farmers and a prized commodity in global markets. However, its cultivation faces increasing threats, particularly from plant diseases that affect yield, quality, and farmer livelihoods. Fungal infections like rhizome rot and leaf spot, have become major challenges, exacerbated by changing climatic conditions and unsustainable farming practices. These diseases not only reduce productivity but also threaten the long-term sustainability of Lakadong turmeric. This article explores the disease-related challenges as well as various economic and technical challenges affecting this prized spice and highlights potential solutions. Addressing these threats through scientific research, farmer education, and policy support is crucial to preserving the legacy of Lakadong turmeric and ensuring its continued contribution to Meghalaya's agricultural economy.

## INTRODUCTION

Lakadong turmeric, prized for its exceptional curcumin content and deep golden hue, has long been a

cornerstone of traditional medicine and agriculture in Meghalaya, India. However, this valuable crop faces increasing threats from



climate change, soil degradation, and market exploitation, endangering both its quality and the livelihoods of local farmers. As global demand rises, preserving Lakadong turmeric requires a multifaceted approach, including sustainable farming practices, policy interventions, and scientific research. This article explores the challenges threatening Lakadong turmeric and the urgent efforts being made to protect its legacy for future generations. This indigenous variety has gained global recognition for its potent medicinal properties, making it a sought-after commodity in health, wellness, and culinary industries. However, despite its growing popularity, Lakadong turmeric faces mounting challenges that threaten its survival. Unsustainable agricultural practices, climate change, soil depletion, and the influx of adulterated or low-quality substitutes, 'dummy varieties' in the market pose significant risks to its purity and production.

### The Importance of Lakadong turmeric

The Lakadong turmeric is unique in the world with the potential to change the lives of countless farmers if its uniqueness is properly exploited. With a curcumin content of 7.4% (almost 2% higher than the other varieties), chemical free, the turmeric from the region is much sought after for use in the cosmetic, pharmaceutical and the food industry. The volatile oil content in dry turmeric varies between 3.6% to 4.8%. Unlike most turmeric varieties that thrive in warm, humid climates with temperatures ranging from 20 to 30 degrees Celsius, Lakadong turmeric flourishes in Meghalaya's relatively cool environment. This remarkable spice owes its distinctiveness to the region's abundant rainfall, fertile soil, and picturesque landscape. Additionally, Meghalaya's farmers have preserved the unique flavor of Lakadong turmeric powder for generations by adhering to traditional and organic farming practices. Despite the existence of numerous turmeric varieties,

Lakadong turmeric has retained its distinct identity and remains one of the most sought-after spices globally, thanks to its exceptional health benefits. Lakadong turmeric cultivation is a crucial source of income for local farmers in the Jaintia Hills region of Meghalaya. The Meghalaya government has initiatives to increase Lakadong turmeric production, aiming to boost the local economy and create more employment opportunities. However, despite this good demand farmers have not been able to realize the full economic potential of this crop primarily because of preponderance of small and marginal farmers, absence of focused research, low individual volumes exacerbated by lack of organized aggregation, weak post-harvest management and market facilities, lack of assured irrigation, access to finance and most importantly insufficient planting material in Lakadong.

### Emerging threats to Lakadong Turmeric

#### 1. Fungal diseases

Lakadong turmeric, despite its resilience and high curcumin content, is increasingly vulnerable to various plant diseases that threaten its cultivation in Meghalaya. Fungal infections such as rhizome rot, caused by *Pythium* and *Fusarium* species, pose a significant risk by leading to wilting, decay, and reduced yields. Leaf spot diseases, often triggered by *Colletotrichum* fungi, weaken the plants, affecting their growth and overall productivity. These diseases not only reduce the quality and quantity of Lakadong turmeric but also increase production costs for farmers, as they struggle to manage outbreaks with limited access to disease-resistant varieties and effective organic treatments. If left unchecked, the rising incidence of these plant diseases could severely impact the sustainability of Lakadong turmeric farming, making it crucial to invest in disease management strategies, research on resistant strains, and farmer education to mitigate the risks.

- a) **Leaf spot of turmeric:** The causal organism of the disease *Colletotrichum capsici*, (McRae, 1917) produces symptoms such as small, oval, rectangular or irregular brown spots on either side of the leaves which soon become dirty yellow or dark brown. The centre of the spots is grayish white with numerous black dots in the centre. As the disease advances, the leaves dry up and give a scorched appearance. (Ramakrishnan, 1954)
- b) **Leaf blotch of turmeric:** First the disease appears as small spots of diameter 1-2mm covering both the surfaces of the leaves. The attacked leaf presents a reddish-brown appearance instead of the normal green colour. These spots are later seen to coalesce to form irregular bigger patches. The causal organism of the disease is *Taphrina maculans*.
- c) **Rhizome rot of turmeric:** Rhizome rot of turmeric is caused by *Pythium aphanidermatum*, in infected plants, the basal portion of the shoots appear watery and soft which leads to a reduced root system. The leaves exhibit gradual drying along the margin while the infected rhizomes rot as well as the color changes into different shades of brown.

### Management strategies against fungal pathogens:

Managing fungal pathogens in turmeric, including those causing rhizome rot, leaf spot, and wilt, requires a combination of cultural, biological, and chemical strategies to minimize losses and maintain crop health. Implementing proper crop rotation and ensuring well-drained soil help prevent the buildup of fungal spores, while maintaining adequate spacing between plants improves air circulation, reducing moisture levels that favor fungal growth. Use of disease-free planting material along with measures such as rhizome dip in copper oxy

chloride or zineb (0.3%) for 30 minutes before planting is an effective method to prevent Rhizome rot. Other preventive measures such as soil drenching with copper oxy chloride (0.25%) in and around affected plants can be effective.

### 2. Market and economic challenges

- Many farmers have abandoned Lakadong turmeric cultivation due to low returns, despite the good demand for the spice.
- The majority of the farmers are small and marginal leading to low individual volumes and difficulty in organizing aggregation for better bargaining power.
- Weak post-harvest management and inadequate market facilities further exacerbate these challenges.
- The dominance of middlemen and trader cartelization leads to unreliable price discovery and reduced profits for farmers.
- Insufficient planting material in Lakadong is a major constraint limiting the potential for expansion and increased production.
- The emergence of "dummy" varieties of Lakadong turmeric, which are not of the same quality, dilutes the reputation and value of the original spice.
- Farmers face challenges related to fluctuating prices and accessing credit for their farming activities.

### 3. Technical and knowledge gaps

Farmers lack access to the latest information, skills and technologies to improve their farming practices. Lack of effective knowledge regarding the pest and various disease infestation as well as inadequate extension services limits the ability of farmers to access information and technical support.

## Efforts to Preserve Lakadong Turmeric

To safeguard Lakadong turmeric, the Meghalaya government and local organizations are working to boost production, strengthen its brand identity, and empower farmers and entrepreneurs. Initiatives such as "Mission Lakadong" and the Geographical Indication (GI) status aim to enhance market recognition while encouraging sustainable farming practices to ensure long-term cultivation and quality preservation.

### 1. Government and Local Initiatives for Preserving Lakadong Turmeric

- **Mission Lakadong:** Launched in 2018 by the Meghalaya government, Mission Lakadong aims to scale up turmeric production to 50,000 MT annually by leveraging its strong brand identity and meeting the rising demand, particularly in the pharmaceutical sector. (Meghalaya Agriculture Department, 2022).
- **Geographical Indication (GI) Status:** Lakadong turmeric's GI certification recognizes its distinct qualities and traditional cultivation methods, helping to safeguard local heritage while enhancing its market presence both nationally and globally.
- **Capacity Building & Market Linkages:** The government is actively working on capacity development programs for entrepreneurs while optimizing the supply chain to ensure better profitability for farmers. Additionally, efforts are being made to establish strong market connections, enabling local producers to reach institutional buyers. (Meghalaya Agriculture Department, 2022).

### 2. Local Organizations & Private Sector Involvement

- **Self-Help Groups (SHGs):** Organizations like the Life Spice Federation, in partnership with SHGs, are empowering tribal communities, boosting production, and preserving traditional knowledge.
- **Private Sector Collaborations:** Companies such as Zizira are partnering with farmers to procure, process, and market Lakadong turmeric, strengthening the value chain and expanding market access.
- **Technological Advancements:** Ag Next Technologies, in collaboration with the Spices Board of India, is utilizing AI-driven rapid quality testing solutions, digitizing quality assessment, and enhancing supply chain traceability to ensure premium-quality Lakadong turmeric reaches the market.

### 3. Sustainable Farming Practices:

- Sustainable practices focuses on maintaining healthy soil, reducing environmental harm, and ensuring the organic purity of the turmeric.
- Lakadong turmeric is cultivated using traditional, sustainable farming methods preserving its natural purity and potency.
- Choosing the right rhizome plays an important role to prevent any pest or disease infestation.

### 4. Other notable efforts

- Trinity Saioo, a Padma Shri awardee, has played a crucial role in promoting Lakadong turmeric cultivation and empowering women farmers. (Meghalaya Tourism, n.d.)

- Meghalaya Tourism offers a 2-day, 1-night experience where visitors can learn about the tradition and process of producing Lakadong turmeric, including hands-on experience in the production process. (Meghalaya Tourism, n.d.)
- There's a focus on ensuring the quality and authenticity of Lakadong turmeric, with initiatives like sourcing directly from farmers and processing under supervision.

### CONCLUSION:

Preserving Lakadong turmeric is not just about protecting a spice; it is about safeguarding a legacy of traditional farming, cultural heritage, and economic livelihood for Meghalaya's farmers. Despite the growing threats from climate change, soil degradation, plant diseases, and market exploitation, dedicated efforts from the government, scientific community, and local initiatives are paving the way for sustainable solutions. Through programs like Mission Lakadong, GI certification, organic farming practices, and technological advancements, stakeholders are working to ensure that this prized turmeric

retains its purity and continues to thrive. However, the responsibility does not rest solely with farmers and policymakers—consumers and businesses also play a crucial role in supporting ethical sourcing and promoting fair trade. By embracing sustainable cultivation, strengthening market access, and investing in research, we can secure the future of Lakadong turmeric, ensuring that its golden glow continues to enrich generations to come.

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