

## Blending tradition with innovation: Turmeric's role in Mizo farmers' prosperity

**Mizoram's climate favours turmeric cultivation, but traditional methods and various challenges have limited productivity. From 2020–2023, the adoption of the high-yielding, curcumin-rich variety Megha Turmeric-1 (RCT-1), alongside scientific practices, significantly boosted yields to 12.61 t/ha. Interventions like Jalkund, vermicomposting, and value-addition through turmeric powder processing enhanced sustainability and income, raising farmer earnings by about 50%. Support from ICAR-RC NEH Region, Kolasib, Mizoram enabled farmers in villages like Thingdawl to overcome barriers such as poor seed access and irrigation. These efforts demonstrate how Megha Turmeric-1, when scientifically managed, can transform turmeric farming in Mizoram, improving productivity, profitability, and livelihoods.**

**T**URMERIC (*Curcuma longa* L.), commonly known as Indian saffron or the golden spice, is an herbaceous plant belonging to the family *Zingiberaceae*. It is referred to as *Haladi* in Hindi and *Aieng* in Mizo. Turmeric grows well in various tropical climates up to 1,500 m above sea level, with temperatures ranging from 20°C to 35°C and annual rainfall of at least 1,500 mm. It thrives best in partial shade and can be intercropped in fruit orchards and plantation fields. Certain vegetables and foodgrain crops can also be intercropped with turmeric to provide additional shade.

Turmeric has been an important economic crop in India, including in Mizoram. The state offers a favourable climate throughout the year for turmeric cultivation, which is mostly practiced under traditional *jhum* farming. *Jhum* farming, mainly practiced on undulating terrain, involves clearing forests using slash-and-burn techniques, followed by mixed cropping under rainfed conditions and periodic land rotation. It remains a major source of rural livelihood for the Mizo people. However, this type of farming typically relies on traditional crops and cultivars, resulting in low production and productivity, making it a subsistence form of agriculture.

### Challenges and opportunities

In Mizoram, turmeric cultivation using traditional cultivars is typically practiced under rainfed conditions, often in mixed cropping systems

with local maize, upland rice, traditional vegetables, and arecanut plantations under *jhum* farming. Although the state receives nearly 2,000 mm of annual rainfall, mostly between June and October, scant or no rainfall during the remaining months leads to water stress toward the end of the crop season.

Inadequate post-harvest handling results in farmers selling their produce at lower prices during glut periods and facing significant post-harvest losses. Moreover, the lack of turmeric processing units limits market options and prevents farmers from earning optimal profits. Consequently, many are forced to sell at low prices or leave crops unharvested in the field, missing out on the full benefits of their labor.

Despite these challenges, Mizoram holds considerable potential for enhancing farmers' incomes by introducing high-yielding turmeric varieties with high curcumin content, combined with scientific farming practices. The region's favourable year-round climate, fertile soil rich in organic matter, and relatively high literacy rate among farmers strengthen this potential.

Integrating turmeric with crops like maize, sweet corn, rice, legumes, and plantation crops such as arecanut can provide continuous income and employment throughout the year. The establishment of *jalkund* structures for supplemental irrigation





during the *rabi* season can also lead to improved crop yields.

### Intervention

Participatory Rural Appraisal (PRA) was conducted in selected villages—Thingdawl (Kolasib District), Marpara South (Lunglei District), and Kamalanagar-II (Lawngtlai District)—to identify and select farmers based on their interest, location, and available farm resources. Selected farmers were provided with the high-yielding, curcumin-rich turmeric variety Megha Turmeric-1 (RCT-1), developed through clonal selection from *Lakadong* by the ICAR-Research Complex for the NEH Region, Umiam.

Although promotion of this variety in Mizoram had begun earlier, systematic efforts from 2020 onwards focused on assessing adoption patterns and measuring its impact on production and farmer income. Supplementary inputs such as quality seeds of sweet corn, maize, and vegetables, along with fertilizers, vermibeds for vermicomposting, and *jalkund* sheets for water harvesting, were provided to develop a turmeric-based integrated farming system model.

Training sessions on scientific cultivation practices, post-harvest management, and processing techniques were organized periodically to enhance farmers' practical knowledge. The interventions were carried out with the support of ICAR-AICRP on Spices and implemented by ICAR-RC NEH Region, Kolasib, under the guidance of ICAR-RC NEH Region, Umiam, and ICAR-IISR, Kozhikode.

Following the successful establishment of turmeric-based integrated farming system models, an automated grinding machine was provided to the Thingdawl turmeric farmers' group in 2022 at the ICAR-RC NEH Region, Kolasib to support turmeric processing into powder.

### Turmeric cultivation

The introduced variety Megha Turmeric-1, benefited 32 farmers each year from 2020 to 2023. Its attractive colour, due to high curcumin content, and high yield encouraged many farmers to adopt this variety. The average productivity across the three selected villages was 25.33 q per 2,000 m<sup>2</sup> (~12.61 t/ha), which is more than three times the average productivity of turmeric in Mizoram (3.85 t/ha).

The cost of production in the three villages ranged between ₹1,76,857/ha and ₹1,84,444/ha. Since high cost of seed rhizomes is a limiting factor for small and marginal farmers, they were distributed free of cost to enable multiplication and storage for use in the next season. Additional farm inputs were provided as needed.

The benefit-cost ratio ranged from 2.35 to 2.74 across the villages, considering a rhizome price of 40/kg. Farmers are now able to produce their own seed rhizomes for the following season and gradually expand their cultivation. Cultivation of turmeric cv Megha Turmeric-1

### Turmeric processing

The cultivation of Megha Turmeric-1 has positively influenced other farmers in Thingdawl village, motivating



Cultivation of turmeric cv Megha Turmeric-1





Turmeric grinder handed over to the Thingdawl farmers by the former Hon'ble Chief Minister of Mizoram (top left). The installation and operation of the turmeric grinder took place in Thingdawl, Kolasib District



### Estimation of the economics of turmeric processing

| Particulars                                                                                              | Amount (₹) |
|----------------------------------------------------------------------------------------------------------|------------|
| Total yield of processed turmeric powder from 1ha of land (approx. 12.61 t f.w. and 20% dry recovery) is | 2,522      |
| Total cost of processing for one ha of dry turmeric (₹100/kg)                                            | 2,52,200   |
| Selling price for one ha powder, i.e. 2,522 kg at ₹400/kg in the local market                            | 10,08,800  |
| Cost of raw turmeric rhizome (12.61 t/ha at 40 ₹/kg)                                                     | 5,04,400   |
| Net benefit by selling turmeric powder over raw rhizome ₹ [10,08,800- (5,04,400+2,52,200)]               | 2,52,200   |

many to begin turmeric cultivation. However, processing turmeric into high-value products remained a challenge. To overcome this, an automated grinding machine was provided to the Thingdawl turmeric farmers' group in 2022 to support local cultivators and enhance the value-addition.

Processing of turmeric rhizomes began the same year, resulting in the production of 152.25 kg of turmeric powder, which was sold at ₹400/kg. This generated a net additional income of approximately ₹20/kg over the cost of raw turmeric rhizomes, as shown in the table.

### Turmeric-based integrated farming system

In the Kolasib district of Mizoram, farmers are increasingly transitioning from traditional *jhum* cultivation to turmeric-based Integrated Farming Systems (IFS), supported by ICAR-RC for NEH Region, Kolasib. With the introduction of Megha Turmeric-1 and integration of complementary components such as sweet corn, upland rice, ginger, vegetables, plantation crops, piggery, *jalkund*, and vermiculture, farmers have successfully diversified and stabilized their farm enterprises.

Training in scientific cultivation practices and post-harvest handling—particularly turmeric processing into powder—has further enhanced market opportunities. The results have been impressive. On an average landholding of 3–4 acres, farmers' gross annual income nearly doubled from approximately ₹1.41 lakh (pre-2020) to ₹2.95 lakh

during 2020–2023. Net income also increased significantly, from ₹79,800 to ₹1.81 lakh, with the benefit-cost ratio improving from around 2.0 to 2.6.

This transformation highlights how turmeric-based IFS models not only boost profitability but also offer resilience against water scarcity, declining soil fertility, and market limitations. The approach is gaining momentum in the region, contributing to agricultural diversification and improved rural livelihoods.

Success of this model was recognized when the turmeric-based IFS initiative in Kolasib received the *Best Innovative Farmer Award* during the North East *Krishna Kumbha-2023*, organized by the ICAR-Research Complex for NEH Region, Umiam, Meghalaya.

### Impact

Scientific interventions and the adoption of Megha Turmeric-1 have enabled farmers to triple their turmeric production. This success has motivated many others in the region to begin turmeric cultivation. In addition, farmers have started a new venture by processing turmeric into powder, creating value-added products that offer nearly double the income compared to selling raw rhizomes. This enterprise has opened up new market opportunities and is expected to generate even higher income with increased production and improved efficiency in the future.

Megha Turmeric-1 is widely accepted by farmers due to its high curcumin content and superior yield potential. The scientific integration of other farming components, along with the introduction of *jalkund* for water harvesting and vermicomposting for organic input generation, has allowed farmers to achieve sustainable, year-round income and employment.

### Future prospects

Mizoram's climate is highly suitable for cultivating quality turmeric, particularly the high-demand Megha Turmeric-1 variety. It performs well as an intercrop and fits seamlessly into the Integrated Farming System (IFS) model. As adoption expands, production is expected to rise, with future efforts focusing on scaling up powder processing, improving packaging, and enhancing marketing strategies to further boost farmer incomes.

To support this growth, continued training in scientific





cultivation, post-harvest management, and value-added product development will be essential. Establishing small-scale, viable processing enterprises and introducing other high-yielding, quality crop varieties can further improve productivity and income. Building a robust marketing and distribution network will be critical to ensuring the reach of quality, processed turmeric products across the country.

### CONCLUSION

Mizoram's agricultural sector holds significant potential for growth, especially with the active participation of youth. Embracing new technologies, high-yielding varieties, quality planting materials, Integrated Farming Systems (IFS), scientific cultivation practices, and efficient

post-harvest management—including value-addition—can greatly enhance farm productivity and profitability. In particular, the introduction of the high-yielding turmeric variety Megha Turmeric-1, combined with improved processing and integration into IFS models, is poised to significantly boost turmeric production and increase farmers' incomes across the state.

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