

From Waste to Wealth: Mushroom Cultivation (An Emerging Agribusiness Opportunity in Telangana)

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OPEN ACCESS

Keywords

Mushroom Cultivation, Nutritional Security, Sustainability, Extension Efforts

How to cite this article:

Yamini, T., Shashanka, D. and Arivelarasan, T. 2026. From Waste to Wealth: Mushroom Cultivation (An Emerging Agribusiness Opportunity in Telangana). *Vigyan Varta* 7 (06): 177-181.

ABSTRACT

Rising concerns about food insecurity, malnutrition and unemployment, coupled with increased health awareness after the COVID-19 pandemic, mushrooms are gaining global recognition as a nutritious, sustainable and income-generating food source. In countries such as India and China, growing consumer demand and favourable cultivation conditions have accelerated the expansion of mushroom farming. Technological advancements, including smart farming, strain improvement and nutrient bio-fortification, are further enhancing production and quality. As a profitable agribusiness with expanding domestic and export markets, mushroom cultivation holds significant potential for improving nutritional security, creating employment opportunities and supporting sustainable agricultural development.

INTRODUCTION

Globally, mushroom production has drastically increased five folds since 2000 and presently, stands at 44 million tonnes (FAOSTAT, 2023). According

to country-wise production, China (93%) is the leading country in terms of fresh mushroom production followed by Japan (0.01%) and Poland (0.01%) (FAOSTAT, 2023).

India's mushroom production has been steadily increasing, reaching 0.33 million tonnes (MT) in 2023–2024, placing the country among the top five global producers (Sharma, 2024). Production has drastically increased from 0.24 MT in 2019–2020 to 0.31 MT in 2022–2023, with a constant upward trend (Annual Report, 2022; Sharma 2020, 2024).

In India, mushroom consumption surged during the COVID-19 pandemic due to increased awareness of their health benefits. India primarily cultivates white button (*Agaricus bisporus*), oyster (*Pleurotus* spp.), paddy straw (*Volvarella volvacea*) and milky mushrooms (*Calocybe indica*). India has earned a total of 8.65 million USD from the export of mushrooms during 2020. The mushroom industry has the potential to recycle around 947 million tonnes of agricultural waste generated in India, positioning it as a key component in the next agricultural revolution after the Green Revolution (Inci *et al.*, 2024). Investing in mushroom due to its nutritional value can yields high returns. Per every \$1 spent can generate US\$16, as nutrition is central to the 17 Sustainable Development Goals (SDGs) set by the UN for 2030.

Recent data from ICAR-Directorate of Mushroom Research, Solan during 2024 reported that Bihar is the top mushroom producing state with an average production of 41.3 thousand tonnes and 11% share in total countries production followed by Odisha with around 32.0 thousand tonnes of production and Maharashtra (30.0 thousand tonnes).

Telangana is a high-potential state for mushroom cultivation due to its warm climate, abundance availability of resources like agricultural crop waste residues, human labour, government subsidies and high demand due to Hyderabad's large food market. Mushroom cultivation in Telangana is

expanding as a profitable, low-investment agri-business, particularly for rural women and small farmers. Although the mushroom production and consumption is on the rise, Telangana has a moderate response to it. With wide range of suitable climatic conditions, Telangana state has an enormous scope for cultivating Milky, Oyster and Button mushrooms, which thrive in temperatures between 25°C and 35°C at cheap rates.

What is Mushroom?

A mushroom is the visible, umbrella-shaped reproductive structure (sporophore) of certain fungi. Mushrooms are edible fungi known for their rich nutritional profile and medicinal properties. Considering its immense potential in ensuring nutritional security, generating employment, promoting sustainable agriculture and empowering rural communities, mushroom cultivation is increasingly being recognized as a “future food enterprise.” With rising health awareness and growing demand for sustainable food systems, mushrooms can play a transformative role in achieving food security, improving livelihoods, and supporting economic development in the years ahead.

Nutritional benefits of Mushrooms:

Mushrooms are the ‘Nature’s Nutrient Powerhouse’ rather than being an ordinary vegetable, mushrooms are rich sources of essential nutrients, proteins, vitamins (such as B-complex and vitamin D), minerals (like selenium, potassium, and iron) and antioxidants. Their low calorie and low-fat content, make them unique and an ideal food for people of all age groups. After COVID-19 pandemic, where immunity has become a priority, including mushrooms in our daily diet can significantly contribute to better health outcomes. Regular consumption of mushrooms can boost immunity, improve heart health by reducing cholesterol levels,

manage diabetes due to low glycaemic index, helps in weight loss and provide anti-inflammatory and antioxidant benefits. Due to these health-promoting properties, mushrooms are gaining popularity among health-conscious consumers worldwide.

Versatility of Mushrooms for Culinary Purpose

Mushrooms are highly versatile functional foods that can be conveniently incorporated into everyday meals easily. They are commonly utilized in various culinary products such as curries, fried rice, pulao, soups, salads, snack items including pakoras and cutlets, as well as value-added products like pickles, dried mushroom products and even ice creams. Owing to their nutritional richness and adaptability in food formulations, mushroom-based preparations are widely accepted and liked by individuals across all age groups, from children to the elderly. Their unique flavour and texture enhance the taste of dishes, making them a favourite among both vegetarians and non-vegetarians.

Mushrooms as a Source of Income

Apart from their nutritional importance, mushrooms offer excellent opportunities for income generation, especially for rural youth, women, small and marginal farmers. Mushroom cultivation requires low initial investment (Rs. 50,000- Rs. 1,50,000/-), minimal land requirement of 200sq.ft – 500 sq. ft. (a converted farm shed/ low-cost polyhouse/ unused rooms in our homes), short production cycle, use of agricultural waste (like straw) as substrate. Popular varieties such as oyster mushroom, button mushroom and milky mushroom can be cultivated with basic training and locally available resources. In high-resource settings, technological advancements enable farmers to maximize mushroom quality and yields ranging from 40-60 kgs per batch of 100 bags (400-

500gms/bag) while minimizing cost and input resources.

Advantages of Mushroom Cultivation especially in Telangana:

- **Short life cycle:** Harvesting can be done within 45–60 days.
- **Ideal Climate:** The warm climate of Telangana with 25-35°C is perfect for growing Oyster mushrooms year-round whereas as hot summer months are perfect for Milky mushrooms and winters are best suitable for growing Button mushrooms.
- **Locally available raw materials:** Paddy straw, cotton stalks, sugarcane bagasse etc., are abundantly available locally.
- **Consistent Returns with year-round production:** With controlled conditions, cultures can be grown throughout the year with low investment and high returns. Return on investment (ROI) can be achieved within 6-8 months of starting.
- **Government and institutional support:** Various schemes like MIDH provide subsidies ranging from 50%- 95% of the cost and several institutions like PJTSAU, KVKs are providing trainings for farmers and interested agripreneurs on technological advancements of mushroom cultivation.
- **High market demand and scope:** Numerous hotels, restaurants, hostels and colleges, vegetable markets, supermarkets in and around Hyderabad demands large quantities of mushroom regularly. Even online marketing can be done through various mobile apps.
- **Employment Generation:** Ideal for self-employment and small-scale enterprises especially for unemployed youth and women.

- **Value Addition Opportunities:** Drying, pickling and powder making can increase market demand and attract high prices. Farmers and entrepreneurs can also link with local markets, supermarkets and online platforms to sell fresh and processed mushrooms.

Need for Awareness and Promotion

Despite their immense benefits, mushroom consumption in many parts of Telangana is still low due to lack of awareness and misconceptions. Extension agencies, universities, government departments and national institutions should focus on creating awareness about health benefits, conducting skill-based training programs on mushroom cultivation, processing and post-harvest management, promoting entrepreneurship and supporting market linkages.

Extension efforts in Telangana:

Keeping in view of the above mentioned nutritional benefits, economic feasibility and environmental sustainability of mushroom cultivation, the government of Telangana has twitched several initiatives and institutional support in promoting mushroom cultivation. Various policies, training programmes, subsidies and research and development activities undertaken by agricultural universities, research institutes and extension agencies are encouraging farmers and entrepreneurs to adopt mushroom farming as a viable enterprise.

Government & Research Support:

- ✚ The agricultural universities like Professor Jayashankar Telangana State Agricultural University (PJTSAU) at Rajendranagar and Kaveri University, institutions like NIRDPR, KVKs offers trainings on technological advancements of spawn production for farmers, women and unemployed youth. Supported by trainings

from these institutes creates significant income potential, with potential yields of 1000–1500 kg from small areas.

- ✚ Regular one-day awareness and skill-building programs are being conducted by the Telangana Horticulture Training Institute (Red Hills, Nampally) for aspiring agripreneurs.
- ✚ Schemes like Udyam (MSME), MIDH - National Horticulture Mission, PMEGP (MSME Scheme), Rashtriya Krishi Vikas Yojana (RKVY), FPOs and NABARD Refinance Scheme, etc., are providing low interest subsidies for the farmers. Low-interest crop loan at 4-7% interest rate are availed to individual farmers with Kisan Credit Card (KCC).

CONCLUSION

Despite Telangana's favourable climate for various types of mushrooms, scaling up production requires improvements in infrastructure, post-harvest technologies and shelf-life extension. Continued research and development in value-added products, ready-to-use mushrooms and bio-fortification will be essential to meet rising domestic and international demand, ensuring growth in the mushroom industry. Adopting mushrooms is not just a dietary choice—it is a step toward better health and standard livelihoods.

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