



Cultivating Sustainability: The Rise of Bio-farming in Modern Agriculture

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Bio-farming, a harmonious blend of science, technology, and nature, has emerged as a beacon of sustainable agriculture. In this article, we delve into the multifaceted world of bio-farming, exploring its principles, practices, and impact on both farmers and the environment. From green manure to biological pest control, we uncover the tools that farmers wield to enhance soil fertility, minimize risk, and produce high-quality crops. Join us on this journey as we celebrate the resurgence of ancient wisdom in modern farming and its potential to shape a greener, more resilient future.

Introduction

Nowadays, third-world countries focus on attaining basic food stock to feed their citizens at a reasonable cost (FAO, 2006). Bio farming helps generate employment in farm sector and improves quality of products which yields better market price and results into the social and economic upliftment of farmers (Kortbech-Olesen, 2000). Bio-farming minimizes the use of chemicals leads better quality food products with high nutritive values which maintain better health. Bio-farming is a system of crop and livestock production with the help of crop rotation, crop residues, organic waste, green manure, and biological pest control (Elpiniki et al., 2016). Codex Alimentarius Commission (1999) defines "Organic farming as holistic food production management system, which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity. Bio-farming emphasizes the use of management practices in preference to the use of off-farm input staking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfill any specific function within the system".

Concept of bio-farming

"Bio-farming, although an ancient concept, remains relatively less known compared to traditional farming. However, it efficiently utilizes natural resources and techniques such as green manure, crop residues, crop rotation, biological pest control, and composting. These practices contribute to maintaining soil fertility over extended periods without relying on synthetic fertilizers or growth regulators. Bio-farming is an economically viable approach that minimizes crop failure even in adverse climatic conditions, ensuring agricultural sustainability. By transitioning from traditional management to organic practices, it combines science, technology, and nature. Key components of bio agriculture include soil management, weed control, livestock integration, genetic diversity, composting, bio-fertilizers, and green manure."

The basic principles of bio-farming

- Pollution-free environment and resilient to climate change

- Free from chemical pesticides and fertilizers
- To maintain the fertility of soil through organic farming
- High nutritional value of food
- Healthy environment for sustainable agriculture
- To produce the required quantity of food with good quality
- To allow each person who involved in bio-farming production and processing a quality life that meets their basic need and allow an adequate return and satisfaction from their work, including a safe working environment.

Benefit of Bio-agriculture

- **Eco-Friendly and Ecological Balance:** Biofarming maintains ecological harmony by using natural processes and minimizing harm to the environment.
- **Resource Conservation:** It helps conserve natural resources, ensuring their sustainable use for future generations.
- **Cost-Effective High-Quality Products:** Biofarming yields good-quality produce while reducing input costs.
- **Enhanced Soil Fertility:** Through organic practices, biofarming improves soil health and texture.
- **Climate Resilience:** Biofarming adapts well to climate change, reducing the risk of crop failure.
- **Minimized Food Contamination:** By avoiding synthetic chemicals, biofarming contributes to safer food products.
- **Plant Self-Protection Mechanisms:** It encourages plants to develop their own defense mechanisms.
- **Water Efficiency:** Biofarming reduces water requirements for crop cultivation.

Current scenario of Organic Farming in India

In the year 2022-23, approximately 17,11,107 hectares were under organic cultivation, with an additional 27,64,729 hectares in the process of conversion. Wild harvest collection covered around 28,50,156 hectares. The commercial output from organic farms totaled approximately 32,28,233 metric tons, while farms in transition contributed 3,22,248 metric tons. Wild-harvested organic produce accounted for 23,740 metric tons. India exported a total of 2,61,029 metric tons of organic products, valued at ₹4,007.91 crore (approximately 494.80 million USD). The United States was a significant market for these exports. Despite challenges posed by the COVID-19 pandemic, India's organic industry remains strong. In market year 2020/2021, organic product exports surpassed \$1 billion, with the United States absorbing a substantial portion.

Conclusion

Biofarming offers farmers various avenues to increase income and elevate their status in society. It outperforms conventional farming in terms of productivity per unit area. However, effective management practices in biofarming are crucial for improving soil fertility and minimizing degradation. Despite its impact in India over the past few years, the lack of sector-specific policies from the government and research institutions hinders its widespread adoption. Strengthening policy-making efforts could enhance both the position of biofarming in the agricultural sector and contribute to the country's overall economy.

References

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