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Vermicompost: A Tool for Agripreneurship Development for the Unemployed Youths of India

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ABSTRACT: Unemployment among youth is a major concern in India, with lack of skills and opportunities being major contributing factors. At the same time, there is a growing need for sustainable and eco-friendly agricultural practices to support the increasing population and reduce environmental impact. Vermicomposting provides an innovative solution that can address both these challenges by empowering unemployed youth to become Agripreneurs. Vermicompost is nutritious organic fertilizer produced through bio-oxidation and stabilization of organic material by interactions between earthworms and microorganisms. Vermicomposting is a low-cost, sustainable technique that converts waste into a valuable resource, while also generating self-employment opportunities, especially for rural and peri-urban youth. This review article highlights the immense potential of vermicomposting as a tool for sustainable Agripreneurship development among the unemployed youth of India. The key opportunities, benefits, and challenges are discussed, along with recommendations to promote vermicomposting through skill training, financial support, and market linkages. If implemented judiciously, vermicomposting can stimulate green entrepreneurship, rural transformation, sustainable agriculture and youth empowerment in India.

Keywords: Vermicompost, Earthworms, Agripreneurship, Unemployment, Youth Empowerment, Sustainable Agriculture.

INTRODUCTION

With a large young population, India faces the challenge of gainfully engaging its unemployed youth. As per recent statistics, the unemployment rate among individuals aged 15-24 years is around 27% (Anonymous, 2022). Lack of skills, proper guidance, financial support, and relevant opportunities have been identified as major hurdles faced by the youth in securing sustainable livelihoods (Mehrotra, 2018). At the same time, there is a growing realization that environmentally damaging chemical-driven agriculture needs to shift towards sustainable and eco-friendly practices. In this context, vermicomposting presents an innovative solution that can address the dual objectives of sustainable agriculture and youth empowerment (Kale, 2004, Bordoloi, 2021 a, b).

Vermicompost is the product of bio-oxidation and stabilization of organic material through interactions between earthworms and microorganisms (Singh *et al.*, 2019). The use of vermicompost in agriculture is an ancient practice that has recently regained popularity as a sustainable alternative to chemical fertilizers (Singh *et al.*, 2019; Bordoloi, 2021 b). Vermicompost enhances soil fertility physically, chemically and biologically. The bio-chemical processes involved in vermicomposting also transform organic wastes into a value-added resource. This enables organic waste management along with production of quality compost. The vermicomposting process is simple, low-cost, and provides opportunities for entrepreneurship development even with low investments (Edwards, 2011; Bordoloi, 2021 c). Equipping unemployed rural and peri-urban youth with vermicomposting skills can enable them to become Agripreneurs producing and marketing organic compost. This review highlights the prospects and advantages of vermicomposting as a sustainable opportunity for Agripreneurship development among unemployed Indian youth. An overview of relevant studies on different aspects of vermicomposting and its role in sustainable agriculture is provided. The review concludes by emphasizing the considerable scope for uplifting unemployed youth through vermicomposting Agripreneurship models, thereby contributing to rural development, environmental protection, and India's sustainable future.

BENEFITS OF VERMICOMPOSTING

Vermicompost provides multiple agronomic, environmental, and socio-economic benefits that make it ideal for sustainable farming practices (Singh, 2015). The key benefits of vermicompost are

Improved soil health and crop productivity: Vermicompost enhances physical, chemical, and biological properties of soil. It improves porosity, aeration, and drainage, while reducing compaction of soil (Lazcano *et al.*, 2008; Bordoloi, 2021 a). The nutrients are released slowly and retained for longer

duration, making them available during critical crop growth stages (Arancon *et al.,* 2003). Vermicompost contains plant growth regulating hormones and humic acids that stimulate germination, plant growth, and yields (Edwards *et al.,* 2010). Studies confirm the positive effects of vermicompost on productivity of cereals, vegetables, fruits, flowers, and plantation crops (Bordoloi, 2021d; Bordoloi & Islam 2020).

Environment-friendly organic waste management: Earthworms can feed on different organic wastes such as crop residues, agro-industrial wastes, animal manure, and urban garbage (Yadav & Garg 2011). Vermicomposting converts these wastes into nutrient-rich compost, thereby reducing waste accumulation (Bordoloi, 2021a). It improves the quality of organic substrates and enables safe recycling of farm and household waste.

Low-cost technology with eco-benefits: Vermicomposting requires simple farm-scale or decentralized micro-units with low capital costs compared to composting. It promotes circular economy by transforming wastes into resources. Vermicompost enhances soil carbon sequestration and mitigates climate change impacts (Bhattacharya *et al.,* 2016).

Livelihood generation: Small and marginal farmers can adopt vermicomposting with minimal training using local resources. It provides income and employment opportunities across the supply chain from production to marketing. Youth and women self-help groups can also undertake vermicomposting micro-enterprises (Joshi *et al.,* 2015; Bordoloi *et al.,* 2020).

The multifaceted advantages make vermicompost an integral component of climate-smart sustainable agriculture. Widespread adoption of vermicomposting can support green growth and rural livelihoods.

YOUTH AGRIPRENEURSHIP OPPORTUNITIES IN VERMICOMPOSTING

The rising demand for organic produce coupled with increased environmental awareness is expanding the market for vermicompost. This presents Agripreneurship opportunities for educated yet unemployed youth from rural areas.

Some key prospects for youth empowerment through vermicompost enterprises are

Sustainable self-employment: Youth can undertake vermicompost production as standalone micro-enterprises with low startup costs. Available land, animal dung, and biomass are the primary resource requirements (Garg & Gupta 2011). Mushrooming urban markets for organic composts provide ready avenues for expansion.

Supplemental income source: Small and marginal farmers can augment farm incomes by utilizing spare labour for vermicomposting using farm waste (Karmegam & Daniel 2009). Women farmers can also manage vermicompost units along with household responsibilities.

Rural-urban linkages: Peri-urban youth can leverage urban organic waste demand and link with rural youth groups for raw material supply to develop commercially viable vermicompost ventures.

Capacity building and training: Hands-on training programs on vermicomposting methods and entrepreneurship can help youth set up and manage their enterprises more effectively. Collaborating with agricultural institutes can facilitate technical capacity development.

Market linkages: Tie-ups with government extension services, farmers' associations, and organic product companies can aid market access. Participation in rural entrepreneurship fairs and exhibitions also provides exposure and networking opportunities.

Access to credit and subsidies: Youth vermicomposting units can avail financial assistance provided under state and national level schemes for rural entrepreneurship, self-employment, and environment protection (Chand & Singh 2017).

Successful implementation of programs supporting youth Agripreneurs through training, financial, and marketing networks will unlock vermicomposting's potential for gainful self-employment.

CHALLENGES AND LIMITATIONS OF VERMICOMPOSTING

Despite its benefits, growth of vermicomposting faces some limitations that need to be addressed. The key challenges reported in literature are

Optimal resource requirement: The feed material should have appropriate nutrient balance to support earthworm growth. Deficiencies retard vermicomposting and quality.

Labor intensive preprocessing: Manual sorting, grinding, and blending of heterogeneous wastes increases drudgery and cost. Lack of suitable equipment can constrain large-scale production.

Variable output quality: Quality of vermicompost depends on the feedstock, species of earthworm, and process parameters. Standardization and quality assurance systems are inadequate.

Lack of cold storage: Being a biological process, vermicomposting is affected by temperature. Lack of cold storage in warmer regions leads to decreased yields.

Marketing and awareness: Absence of established distribution networks and lack of awareness among farmers affect wider uptake Competition from low priced chemical fertilizers also exists in some areas.

The challenges underscore the need for further technical research to develop viable vermicomposting models, especially suited for unemployed youth. Policy and institutional support are equally critical for building young Agripreneurs' capacities and linking them to markets.

RECOMMENDATIONS FOR PROMOTING VERMICOMPOSTING AMONG YOUTH

Realizing the full potential of vermicomposting as a tool for gainful youth engagement in sustainable agriculture requires integrated policy and program support. Some key recommendations based on lessons from successful initiatives across India are

Skill development: Hands-on training on technical aspects of vermicomposting coupled with

entrepreneurship guidance should be provided through rural self-employment institutes and agricultural universities.

Financial assistance: Startup and working capital needs of youth ventures can be supported through low-interest credit provided by regional rural banks and national schemes for green entrepreneurship.

Infrastructure and equipment: Common vermicomposting sheds equipped with shredders, screens, and potting equipment could be set up in villages through government programs or public-private partnerships.

Market linkages: Youth groups should be connected to government extension services and organic produce rsorganizations to expand market access. Participation in exhibitions and dedicated organic markets should be facilitated.

Quality assurance: Standardized testing and certification mechanisms for vermicompost need to be institutionalized. Branding and packaging solutions can also help youth enterprises fetch better prices.

Digital solutions: Mobile apps and online platforms can aid capacity building, information exchange, marketing, and supply chain management for youth vermicompost ventures.

An integrated approach encompassing technical, financial, infrastructure, marketing, and policy interventions is required to harness vermicomposting's immense potential for productive youth engagement and rural prosperity.

CONCLUSIONS

Vermicomposting provides a sustainable means for converting organic wastes into a valuable agricultural input that enhances soil health, crop yields, and food quality. The process generates environment-friendly organic fertilizer while mobilizing unutilized organic materials. Vermicompost production through small decentralized units also offers avenues for eco-enterprise development requiring low investments. These attributes make vermicomposting well-suited for promoting green Agripreneurship opportunities for unemployed youth in India. By equipping rural and peri-urban youth with vermicomposting skills and linking them to markets, youth entrepreneurship and empowerment can be stimulated while also making agriculture sustainable. However, enabling mechanisms in the form of technical guidance, financial support, infrastructure, quality assurance, and marketing linkages are vital for the wider adoption and success of youth-led vermicompost enterprises. Purposeful policy interventions in these areas coupled with grassroots-level awareness generation can unleash vermicomposting as a win-win solution for youth unemployment and sustainable rural transformation.

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