

INTRODUCTION

In the heart of the Himalayas lies Uttarakhand, a region known for its rich biodiversity and agricultural potential. The introduction of vermi composting in this area presents a unique opportunity to blend traditional farming practices with sustainable techniques. Vermicompost, commonly known as worm compost, is a nutrient-rich organic fertilizer and soil conditioner, produced through the decomposition of organic material by various species of earthworms. This project aims to establish a vermicompost production unit in Uttarakhand, leveraging local resources and manpower to create a sustainable, eco-friendly, and profitable business model.

1. PRODUCT & ITS APPLICATION

The primary product of this project is high-quality vermicompost, characterized by its fine texture, dark color, and rich nutrient content. It is an excellent organic fertilizer and soil amendment, widely used in agriculture, horticulture, and landscaping. In Uttarakhand, where agriculture forms a significant part of the rural economy, the use of vermicompost can greatly enhance soil fertility, crop yield, and quality. It is especially beneficial for organic farming, which is gaining popularity in the region due to increasing demand for organic products. The compost can also be used in nurseries, kitchen gardens, and for reclamation of barren lands.

2. DESIRED QUALIFICATION FOR PROMOTER

The ideal promoter for this vermicompost project should possess a blend of educational and practical experiences. A basic understanding of agriculture, environmental science, or related fields is beneficial. Entrepreneurial skills, along with experience in farming or agribusiness, are essential to navigate the complexities of the agricultural market. Additionally, familiarity with the local culture, climate, and agricultural practices of Uttarakhand will be an advantage. The promoter should also have a commitment to sustainable practices and a vision to contribute positively to the local economy and environment.

3. INDUSTRY OUTLOOK AND TRENDS

The agricultural sector in Uttarakhand is witnessing a shift towards organic and sustainable farming practices, making vermi compost increasingly popular. With the growing awareness about the adverse effects of chemical fertilizers, both farmers and consumers are leaning towards organic products. The government's push towards organic farming, combined with a growing global demand for organic produce, positions vermi composting as a lucrative and future-proof industry. The trend is towards localized, small-scale production units that can cater to specific regional demands while minimizing transportation costs and environmental impact.

The global vermicompost market is expected to grow from \$85.39 million in 2022 to \$270.25 million by 2030, with a compound annual growth rate (CAGR) of 15.56% between 2023 and 2030. India is the world's largest exporter of vermicompost. In 2022–2023, vermicompost exports were projected to total \$1 billion in value. India exports most of its vermicompost to the United Arab Emirates, Maldives, and South Korea.

4. MARKET POTENTIAL AND MARKETING ISSUES; IF ANY

The market potential for vermi compost in Uttarakhand is vast, given the region's extensive agricultural activities and the increasing preference for organic farming methods. The primary market includes local farmers, organic produce marketers, and nurseries. However, challenges exist in the form of market awareness and distribution. Many local farmers may still be unaware of the benefits of vermi compost, necessitating educational and marketing campaigns. Additionally, establishing a robust distribution network that can efficiently reach remote and hilly areas is crucial for market penetration.

In India, the adoption of vermicompost as a sustainable and organic fertilizer is gaining momentum, supported by a diverse array of brands and players dedicated to enhancing agricultural and horticultural practices.

TrustBasket is notable for its vermicompost that enriches the soil with beneficial microorganisms and naturally attracts earthworms, fostering a vibrant and healthy soil ecosystem. Ugao sets itself apart by offering a vermicompost free from soil worms,

focusing on delivering nutrient-rich organic matter to plants without the addition of live earthworms. Neem Enviro introduces an innovative approach by incorporating neem cake powder into its vermicompost, leveraging neem's pest repellent properties to protect plants from insects and other pests.

Eco Friend Organic World takes a comprehensive approach to vermicompost production, utilizing a mix of organic waste, cow dung, coconut coir, earthworms, and water to create a high-quality compost that supports plant growth and soil health. Sikri Farms, a brand that has earned national recognition for its vermicompost technology, is celebrated for its commitment to quality and innovation in organic fertilizer production. The increasing interest in vermicompost from various sectors, ranging from small household gardeners to large-scale farmers, reflects a growing awareness of its benefits for soil health and plant growth.

This shift towards organic fertilizers like vermicompost is further encouraged by the central and state governments' initiatives to transition India from traditional chemical farming methods to more sustainable and environmentally friendly practices.

5. RAW MATERIAL REQUIREMENTS

The primary raw materials for vermi compost production are organic waste materials such as farm residues, animal manure, kitchen waste, and forest litter. In Uttarakhand, these materials are abundantly available, often as agricultural by-products.

Partnering with local farms and communities to source these raw materials can create a sustainable supply chain. Additionally, specific species of earthworms, like *Eisenia fetida*, are required, which can be sourced from local suppliers or agricultural universities in the region.

6. MANUFACTURING PROCESS

The process of vermicomposting involves a series of well-defined steps, beginning with the collection and preparation of raw material. Organic waste is gathered and shredded to increase its surface area, facilitating quicker decomposition. The next crucial step is setting up the vermi beds or bins, which must be prepared with careful attention to aeration and

moisture control to create an ideal environment for the earthworms. Once the beds are ready, earthworms are introduced to start the process of vermicomposting.

Feeding and maintenance of the vermi beds are ongoing tasks, requiring the regular addition of organic waste to feed the worms while maintaining optimal conditions of moisture and temperature for their activity. After about 3-4 months, the vermicompost is typically ready for harvesting. This involves separating the compost from the worms and screening it to ensure a uniform texture.

Finally, the harvested compost is packed into suitable bags for storage and sale. Proper packaging and storage are essential to keep the compost dry and well-aerated, preserving its quality until it reaches the end user. The Bureau of Indian Standards (BIS) provides guidelines for the construction and requirements of high-density polyethylene (HDPE) woven beds for vermiculture through the standard IS 15907:2010, underscoring the importance of using appropriate materials and techniques in the vermiculture process. Vermiculture, the practice of worm-farming, transforms organic waste materials into nutrient-rich vermicasts through the digestion process of earthworms, contributing significantly to sustainable waste management and soil enhancement.

7. MANPOWER REQUIREMENT

Sr. No	Particulars	No. of Person	Months	Monthly Wages Amount/Person (Rs in Lakhs)	Monthly Wages - Total (Rs in Lakhs)	Annual Expenses (Rs in Lakhs)
1	Skilled	2	12	0.22	0.44	5.28
2	Semi-skilled	2	12	0.15	0.30	3.60
3	Unskilled	3	12	0.10	0.30	3.60
	Total					12.48

8. IMPLEMENTATION SCHEDULE

Sr. No.	Activity	Time Required (months)
1	Acquisition of Premises	1
2	Construction (if applicable)	1

3	Plant & Machinery Procurement & Installation	1.5
4	Arrangement of Finance	1
5	Recruitment of Manpower	1.5
	Total Time Required (Some events may run concurrently)	5

9. COST OF PROJECT

Sr. No.	Particulars	Amount (Rs in Lakhs)
1	Pre-operative Expenses	0.55
2	Land and Building	6.00
3	Machinery	2.93
4	Equipment and Furniture	1.00
5	Working Capital	0.80
	Total Project Cost	11.28

10. MEANS OF FINANCE

Sr. No.	Particulars	Percentage Share	Amount (Rs in Lakhs)
1	Promoter's Contribution	25%	2.82
2	Bank Finance	75%	8.46
	Total		11.28

11. LIST OF MACHINERY REQUIRED

A. Machinery

Sr. No.	Particulars	Unit	Unit Cost (Rs in Lakhs)	Total Amount (Rs in Lakhs)
1	Vermi Beds	10	0.05	0.50
2	Shredding Machine	1	0.75	0.75
3	Sieving Machine	1	0.50	0.50
4	Packaging Equipment	1	0.40	0.40
5	Weighing Scales	1	0.10	0.10

	Total Amount	2.25
	Tax, Transportation, Insurance, etc.	0.45
	Electrification Expenses (Wiring)	0.23
	Grand Total	2.93

B. Furniture and other equipment

Sr. No	Particulars	Unit	Unit Cost (Rs in Lakhs)	Total Amount (Rs in Lakhs)
1	Office Furniture and desks	Set	0.60	0.60
2	Computer, software and printer	N/A	0.40	0.40
	Total Amount			1.00

1. PCK Food Tech Solutions Private Limited
M-14 Vishal Garden, Shikrapur Road,
Chakan, Pune - 410505, Maharashtra, India
2. Rachna Udhyog
16/145, Ghatya Azam Khan,
Naya Bans, Agra - 282003, Uttar Pradesh, India
3. R S Engineering Works
Plot No. 905, Jay Jalaram Corporation,
GIDC,VAPI, Valsad - 396195, Gujarat, India

12. SALES REALIZATION CALCULATION

Sr. No	Product	Quantity (in Kgs)	Sales in Percentage	Total Sales (Rs in Lakhs)
1	Vermi Compost	162500	100%	65.00
	Total		100%	65.00

13. PROFITABILITY CALCULATIONS

Sr. No	Particulars - Amount (Rs.)	Year-I (Rs in Lakhs)
A.	Sales Realization	

	Sales (Assuming 15% growth per year)	65.00
	Other Income (Assuming constant)	
	Total Sales Realization	65.00
B.	Cost of Production	
	i) Raw Materials	31.20
	ii) Utilities (Assuming constant)	0.80
	iii) Manpower (Salaries/wages)	12.48
	iv) Administrative Expenses (Assuming constant)	0.58
	v) Selling & Distribution Expenses (Assuming constant)	0.65
	viii) Interest (Assuming constant)	1.13
	Total Cost of Production	46.84
	No of Units Produced	78,063
	Cost of Goods Sold	0.0006
	Gross Profit/Loss (A – B)	18.17
	Less: Depreciation	0.91
C.	PBIT (Profit Before Interest and Tax)	17.26
D.	Income-tax (Assuming 28% tax rate)	4.84
E.	Net Profit/Loss (C - D)	12.43
F.	Repayment	1.13
	Retained Surplus (E - F)	11.3

14. BREAKEVEN ANALYSIS

Fixed cost	Year-I (Rs in Lakhs)
Depreciation	0.91
Interest	1.13
Manpower	3.74
Total Fixed cost	5.78
Variable cost	
Raw materials	31.2

Utilities	0.8
ManPower	8.74
Administrative expenses	0.58
Selling & distribution expenses	0.65
Total Variable cost	41.97
Contribution margin	20%
Break-Even Point in Value	28.90

15. STATUTORY/GOVERNMENT APPROVALS

Legal Compliances for Vermi Compost Production in Uttarakhand

Operating a vermi compost production unit in Uttarakhand requires adherence to various legal and environmental regulations. The following approvals and registrations are essential:

- **Business Registration:** Register the business with relevant authorities such as the Uttarakhand State Industrial Development Corporation (USIDC). The USIDC is instrumental in promoting industrialization and economic development in Uttarakhand, offering support in investments and infrastructure.
- **Tax Registration:** Register for Goods and Services Tax (GST) as per the business type and turnover. This is a unified tax that applies to all goods and services across India.
- **Organic Certification:** For added market value, obtaining organic certification from a recognized authority can be beneficial. This certifies that the vermi compost is produced using organic methods, enhancing its appeal, especially in organic farming sectors.
- **Local Agricultural and Business Regulations:** Compliance with local agricultural regulations and business laws in Uttarakhand is also essential. This might include permissions from local bodies, adherence to regional agricultural practices, and any specific rules pertaining to rural businesses.

16. BACKWARD AND FORWARD INTEGRATIONS

A. Backward Integration

- **Raw Material Sourcing:** Establish partnerships with local farmers, communities, and agri-businesses for a steady supply of organic waste materials, such as animal manure, agricultural residues, and kitchen waste. Develop a collection system that aligns with local agricultural cycles and waste generation patterns to ensure a continuous and sustainable supply of raw materials.
- **Component Production:** Cultivate and maintain a robust earthworm population, crucial for vermi composting. This could involve breeding specific earthworm species that are most effective for composting in Uttarakhand's climatic conditions. Implement in-house processing of organic waste to make it suitable for vermi composting, such as shredding or pre-composting.
- **Quality Control:** Establish a quality control system to monitor the quality of incoming raw materials and the health of the earthworm population. Regularly test the compost for nutrient content, pH balance, and absence of contaminants to ensure a high-quality product that meets agricultural standards.

B. Forward Integration

- **Distribution and Sales:** Develop a robust distribution network to reach local markets, including farmers' cooperatives, nurseries, organic stores, and gardening centers across Uttarakhand. Explore online sales channels and partnerships with e-commerce platforms specializing in agricultural and gardening products.
- **Repair and Maintenance Services:** While not directly applicable to vermi compost, offering guidance and support for compost use and soil health maintenance can be a valuable service. Conduct workshops and training sessions for farmers and gardeners on the effective use of vermi compost and sustainable agricultural practices.
- **Diversification:** Explore diversification into related products such as liquid vermi wash, a by-product of vermi composting, which can serve as a natural pesticide and plant growth stimulator. Consider branching into educational services, like conducting

seminars and training programs on sustainable agriculture and waste management, leveraging the expertise gained from vermi compost production.

17. TRAINING CENTERS AND COURSES

- **GB Pant University of Agriculture and Technology (Pantnagar, Uttarakhand):** Known for its agricultural research and education. Offers courses in organic farming, soil health, and sustainable agricultural practices, which would be beneficial for vermi compost production.
- **Navdanya (Dehradun, Uttarakhand):** A network of seed keepers and organic producers spread across India. Provides training in organic farming, biodiversity conservation, and compost production.
- **Indian Council of Agricultural Research (ICAR):** Has several research institutes across India that conduct training programs in various aspects of agriculture, including soil health and organic farming. ICAR institutes in Uttarakhand or nearby states may offer specialized training suitable for vermi composting.
- **Krishi Vigyan Kendras (KVKs):** Located in various districts of Uttarakhand, these centers are excellent for local agricultural training. They conduct workshops and training sessions on organic farming, composting techniques, and sustainable agricultural practices.
- **Online Platforms and E-Learning Courses:** Websites like Udemy, Coursera, and the

Disclaimer

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.

Government's SWAYAM portal offer courses on organic farming, compost production, and sustainable agriculture. These can be a convenient way to gain knowledge, especially for the theoretical aspects of vermi compost production. Swayam portal (link: <https://swayam.gov.in/>) can also be accessed for enhanced learning on business commerce, accounting, production, marketing, and areas of entrepreneurship.