COMPOST AND ORGANIC FERTILIZER PRODUCTION

1. INTRODUCTION

With the rising focus on sustainable agriculture, soil health improvement, and chemical-free food production, compost and organic fertilizers are witnessing rapid demand growth across the world.
Organic farming, horticulture, floriculture, and home gardening heavily rely on high-quality compost and organic fertilizers.

This project proposes the setup of a composting and organic fertilizer production unit using biodegradable agricultural waste, food waste, and other organic materials.

2. INDUSTRY OVERVIEW

- India's organic fertilizer market is projected to grow at a CAGR of 10% from 2024 to 2030.
- Government schemes like Paramparagat Krishi Vikas Yojana (PKVY) and Zero Budget Natural Farming promote organic fertilizers.
- Demand drivers include degraded soil conditions, increased awareness of organic produce, and restrictions on chemical fertilizer use.

3. PRODUCT AND ITS APPLICATIONS

Products Planned:

- **Vermicompost:** Nutrient-rich compost produced using earthworms.
- **Bio-compost:** Aerobic compost made from farm residues, food waste, and organic biomass.
- **Organic Manure:** Decomposed natural fertilizers rich in Nitrogen (N), Phosphorus (P), and Potassium (K).
- **Enriched Compost (with Biofertilizers):** Compost fortified with beneficial microorganisms (Azotobacter, Rhizobium).
- **Liquid Organic Fertilizers (Phase 2 expansion):** Vermiwash and compost tea.

Applications:

- Agriculture (field crops, horticulture, cash crops)
- Organic vegetable farming
- Tea gardens, vineyards, coffee plantations
- Landscaping and lawn management

- Home gardens and kitchen gardens
- Floriculture, nurseries, and greenhouses

4. RAW MATERIALS REQUIRED

- Agricultural waste (crop residues, husk, straw)
- Fruit and vegetable market waste
- Dairy farm waste (cow dung)
- Food waste (from hotels, restaurants, food industries)
- Municipal organic waste (after segregation)
- Garden and park waste (grass clippings, leaves)
- Earthworms (Eisenia fetida species for vermicomposting)
- Bio-cultures/microbial inoculants for faster decomposition

5. MANUFACTURING PROCESS

Step-by-Step Composting Process:

1. **Collection and Sorting of Raw Materials:**
   Only organic, biodegradable material is selected.
2. **Pre-processing:**
   Shredding of large material into smaller particles for faster breakdown.
3. **Heap Formation or Windrow Composting:**
   Piling waste in long rows for natural aerobic decomposition.
4. **Addition of Microbial Cultures:**
   To accelerate composting and ensure pathogen kill.
5. **Turning and Moisture Management:**
   Regularly turning heaps and maintaining ~50–60% moisture.
6. **Maturation:**
   Compost is allowed to cure for 30–45 days.
7. **Screening and Sieving:**
   Removal of undecomposed particles, yielding fine compost.
8. **Bagging and Packaging:**
   Packing into 5 kg, 10 kg, 25 kg, and bulk 50 kg bags.

For Vermicomposting:

- Organic waste partially decomposed first.
- Beds are prepared with cow dung + farm waste + worms.
- Vermiwash is collected through drainage for liquid fertilizer.

6. LIST OF MACHINERY AND EQUIPMENT

Machinery/Equipment	Purpose
Organic Waste Shredder	Shredding raw materials
Windrow Turner or Manual Turning Tools	Mixing and aerating compost
Compost Sieving Machine	Screening fine compost
Cow Dung Slurry Mixer (optional)	Mixing water and cow dung
Vermibeds (HDPE Material)	For vermicomposting
Moisture Meters	Monitoring compost moisture
Weighing Scales	For accurate packaging
Bagging and Sealing Machines	Packing compost bags
Tractors with Trolleys (for movement)	Material transport

Optional Advanced Equipment:

- Automatic bagging lines
- Compost tea extractors (Phase 2)
- Organic fertilizer pellet-making machine (future expansion)

7. COST OF PROJECT

Particulars	Estimated Cost (₹ Lakhs)
Land Lease/Purchase and Site Preparation	6.00
Machinery and Equipment Procurement	10.00
Vermibeds, Drip Irrigation Setup	2.00
Construction of Sheds and Compost Pits	5.00
Working Capital (Raw Material, Salaries for 6 Months)	5.00
Marketing and Website Development	1.00
Licenses and Certifications	0.50
Miscellaneous and Contingencies	2.00

Particulars	Estimated Cost (₹ Lakhs)
Total Estimated Project Cost	**31.50 Lakhs**

8. REVENUE STREAMS

- Sale of packaged vermicompost and bio-compost
- Bulk supply to organic farms, nurseries, and municipalities
- Sale of liquid organic fertilizers (vermiwash, compost tea)
- Supply contracts with agri-input dealers and garden centers
- Home delivery packs for urban gardeners (online/offline)

9. MANPOWER REQUIREMENT

Position	Number of Staff	Monthly Salary (₹)	Annual Cost (₹)
Plant Supervisor	1	25,000	3,00,000
Composting Operators	4	15,000	7,20,000
Packing and Bagging Workers	2	12,000	2,88,000
Marketing and Sales Executive	1	20,000	2,40,000
Loader/Helper Staff	2	12,000	2,88,000
Total	**10 Staff**		**18,36,000**

10. MARKETING STRATEGY

- **Tie-ups with Organic Farmers, Farmer Cooperatives**
- **Direct Sales to Nurseries, Garden Centers, Retail Stores**
- **Supply to NGOs and Environment Projects**
- **E-commerce Integration:**
  Selling compost packs via Amazon, Flipkart, and our own website.
- **Farmer Awareness Programs:**
  Conduct demonstrations and field days promoting compost benefits.

11. BUSINESS OUTLOOK

- Growing demand for organic inputs due to government policies.
- Urbanization and rooftop gardening trends are boosting city sales.
- Composting is aligned with sustainable waste management policies.

12. MARKET POTENTIAL AND MARKETING ISSUES

Market Potential:

- High in agriculture-dominant states (UP, Punjab, Maharashtra, MP, Rajasthan).
- Urban gardening, organic markets, and eco-tourism resorts prefer organic compost.
- Export potential for vermicompost (Gulf, European countries).

Marketing Issues:

- Competition from chemical fertilizers.
- Need for consumer education on compost benefits.
- Price sensitivity in rural markets.
- Logistic costs for bulky material transportation.

13. RISK FACTORS

- Quality inconsistency if the process is not monitored.
- Pest or pathogen contamination risk.
- Seasonal demand fluctuations.
- Need for strict organic certification for export.

14. ENVIRONMENTAL BENEFITS

- Reduction of landfill organic waste.
- Soil health improvement through natural fertilizers.
- Carbon sequestration by enriching soil organic matter.
- Promotion of circular economy principles.

15. FUTURE OPPORTUNITIES

- Compost pellet production for easier transportation and application.
- Bio-fertilizer and organic pesticide production.
- Consultancy and training business for composting setups.
- Carbon credit trading through organic farming projects.

16. IMPLEMENTATION SCHEDULE

Activity	Timeline
Land Preparation and Infrastructure Setup	Month 1
Procurement of Machinery	Month 1–2
Recruitment of Staff	Month 2
Initial Composting Batch Preparation	Month 2–3
Launch of Marketing Campaign	Month 3
Commercial Operations Start	End of Month 3

17. MEANS OF FINANCE

Source	Amount (₹ Lakhs)	Percentage (%)
Promoters' Capital Investment	12.60	40%
Term Loan from Bank	18.90	60%
Total	**31.50**	**100%**

18. PROFITABILITY CALCULATION

Particulars	Year 1 (₹ Lakhs)	Year 2 (₹ Lakhs)	Year 3 (₹ Lakhs)
Revenue	35.00	50.00	70.00
Operating Expenses	24.00	30.00	38.00
EBITDA	11.00	20.00	32.00
Interest on Loan	2.50	2.00	1.50
Depreciation	2.00	1.80	1.50
Profit Before Tax (PBT)	6.50	16.20	29.00
Income Tax (@25%)	1.62	4.05	7.25
Net Profit After Tax (PAT)	4.88	12.15	21.75

19. BREAK-EVEN ANALYSIS

Particulars	Value
Annual Fixed Costs	₹18.36 Lakhs
Average Selling Price per Kg Compost	₹8–₹12
Minimum Annual Production Target	~3,00,000 kg
Break-even Revenue Needed	₹30–32 Lakhs

20. GOVERNMENT APPROVALS REQUIRED

- Pollution Control Board Consent (small-scale category)
- FSSAI Registration (if selling organic compost as plant feed)
- MSME/Udyam Registration
- Organic Certification (NPOP or equivalent for export)
- GST Registration

21. TRAINING CENTRES AND COURSES

- Indian Council of Agricultural Research (ICAR) Institutes
- National Centre of Organic Farming (NCOF)
- Krishi Vigyan Kendras (KVKs)
- Regional Agricultural Universities

Recommended Training Topics:

- Organic waste management and composting techniques
- Vermiculture and vermicompost production
- Quality control in organic fertilizer manufacturing

22. DESIRED QUALIFICATIONS FOR PROMOTERS

- Bachelor's/Diploma in Agriculture, Soil Science, Environmental Science.
- Training in composting techniques and microbial compost enhancement.
- Basic business management and marketing skills.
- Passion for sustainable agriculture and soil health improvement.

23. CONCLUSION

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The Swayam portal (link: https://swayam.gov.in/) can also be accessed for enhanced learning on business commerce, accounting, production, marketing, and areas of entrepreneurship.

Entrepreneurship programs that help run businesses successfully are also available from institutes like the Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.