PROJECT PROFILE ON VERMICOMPOST UNIT

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INTRODUCTION

Vermicomposting is method of transforming the organic matter of plants and animal origin into a material beneficial for the soil through earthworm digesting. The earthworms being voracious eaters consume the biodegradable matter and give out a part of the matter as excreta or vermi-castings. Organic matter is decomposed with the help of earthworm, is called vermi compost. Earthworm casting contain plant nutrients like nitrogen, phosphorus, potassium and magnesium; the casts also contain enzymes. Besides, that earthworms churning the soil, as they carry down into the soil the fallen leaves, twigs, straw and similar materials.

PRODUCTS AND ITS APPLICATION

- Vermi compost is a useful manure for plants
- Apart from supplying nutrients and growth enhancing hormones to plants, improves the soil structure leading to increase in water and nutrient holding capacities of soil.
- This manure helps plants to increase the productivity and quality improvement.

DESIRED QUALIFICATION FOR PROMOTER

For the preparation of vermi compost little knowledge and skillset require. Simple farmer with raining can produce vermi compost.

INDUSTRY OUTLOOK/TREND

To increase the productivity of agriculture sector with minimum expenditure, vermi compost plays a useful role. India government provides subsidies for the Chemical fertilizers. If subsidy amount reduced on chemical fertilizers, normal farmers cannot afford it. Besides, chemical fertilizers affect the soil health in the long run leading to poor crop health and poor yields. Chemical fertilizers increase ground and air pollution and it results in increased greenhouse effect. Small and marginal farmers can easily afford vermi compost as the alternative organic fertilizers. Use of vermi compost bring down cost of crop production. Vermi composting offers immense scope to small and marginal farmers in creating their own organic manure resources and alternative income generation. There are abundant organic resources available in India, with the help of them country can produce about 20 million tones of plant nutrients per year.

MARKET POTENTIAL AND MARKETING ISSUES, IF ANY

Vermicompost has huge potential in Indian agriculture as a good manure. Vermicompost are mainly used in the field of home gardening, horticulture, golf courses and landscaping. India produces only 10% of the total vermicomposting in the world. Agriculture is the main element of livelihood for around 58% of India's population. Vermicomposting is very popular in the Indian states of Karnataka, Tamil Nadu, Rajasthan, Kerala, Maharashtra, Gujarat, Madhya Pradesh and Odisha. Over the years, excessive use of chemical fertilizers affect the soil health and lead to environmental hazards. On the above backdrop, the need of converting farms from inorganic to organic is being felt in the country, owing to economic and environmental factors. Many government departments including agriculture, forest and horticulture buy it in bulk. It's demand has decreased over the years. Government agencies and NGOs are popularizing organic agriculture using vermicompost by organizing awareness campaigns and film show in rural and urban areas.

RAW MATERIAL REQUIREMENTS

Base materials for vermicopost should organic and biodegradable. Main raw materials for vermicompost are right species of earthworms, cow dung, goat and sheep dung, organic sludge, tree leaves, crop residue, sawdust, sugarcane trash, weeds, coir waste, vegetable waste, slurry from biogas plants, poultry droppings, etc. Of about 350 species of earthworms in India with various food and burrowing habits Eisenia fetida, Eudrilus eugeniae and Perionyx excavatus are some of the species that are reared to convert organic wastes into manure. Red earthworm (Eisenia foetida) is preferred species of earthworms because of its high multiplication rate and thereby converts the organic matter into vermicompost within 45-50 days. Since it is a surface feeder it converts organic materials into vermicompost from top. One earthworm reaching reproductive age of about six weeks lays one egg capsule (containing 7 embryos) every 7-10 days. Three to seven worms emerge out of each capsule. Thus, the multiplication of worms under optimum growth conditions is very fast.

Types of Raw materials	Quantity (Ton)	Rate (INR) per ton	Cost (INR)
Cow dung	125	1200.00	1,50,000.00
Organic residue	250	1000.00	2,50,000.00
Mother Earth worm	1.5	50000.00	75,000.00
Miscellaneous items (gunny bags, packing materials, etc.)		Lump sum	5000.00
Total			4,80,000.00

MANUFACTURING PROCESS

Vermicromposting is done by either bed or pit method. In bed method composting is done on the pucca / kachcha floor by making bed of organic mixture while in pit method it is done in the cemented pits. The process consists of constructing brick lined beds generally of 0.9 to 1.5 m width and 0.25 to 0.3 m height are constructed inside a shed open from all sides. For commercial production, the beds can be prepared with 15 m length, 1.5 m width and 0.6 m height spread equally below and above the ground. The pits are kept shallow to avoid heat built-up that could kill earthworms.

- Vermicomposting unit should be in a cool, moist and shady site
- Cow dung and chopped dried leafy materials are mixed in the proportion of 3: 1 and are kept for partial decomposition for 15 – 20 days.
- A layer of 15-20cm of chopped dried leaves/grasses should be kept as bedding material at the bottom of the bed.
- Beds of partially decomposed material of size 6x2x2 feet should be made, with bricks. Bottom of the bed should be without plastering.
- Each bed should contain 1.5-2.0 quintals of raw material and the number of beds can be increased as per raw material availability and requirement.
- Red earthworm (1500-2000) should be released on the upper layer of bed
- Water should be sprinkled with can immediately after the release of worms
- Beds should be kept moist by sprinkling of water (daily) and by covering with gunny bags/polythene.
- Bed should be turned once after 30 days for maintaining aeration and for proper decomposition.
- Compost gets ready in 45-50 days. The finished product is 3/4th of the raw materials used.

MANPOWER REQUIREMENT (PER MONTH)

Type	Number	Cost (Rs.)
Manager	1	20,000
Labour (skilled)	1	12,000
Labour (unskilled)	1	8,000
Total per month	11	40,000
Total per annum		4,80,000

LAND

Particulars	Area	Rate (INR)	Details (INR)
Land site development (own)			20,000
Building			

• Shed of vermicompost unit	400 sq. ft.	500	2,00,000
• Platform with sheds for finished for finished goods	250 sq.ft.	200	50,000
• Godown, store, labour quarter	300 sq. ft.	500	1,50,000
• Water tank	Lumpsum		30,000
Total			4,50,000

MACHINERY SPECIFICATIONS

Sl. No.	Description	Qty.	Amount (In Rs.)
1	Shovels, Spades, Crowbars, Iron Baskets& Others		15,000
2	Plumbing and fitting tools		10,000
3	Power operated shredder	1 No.	30,000
4	Weighing scale & weighing machine	1 No.	5,000
5	Pump set	1 No.	25,000
6	Water supply system-pipe, dripper etc.	3 Nos.	25,000
7	Wheel barrows/ trolley with handle	1 No.	10,000
8	Sieving machine	1 No.	40,000
9	Culture tray	10 Nos.	5,000
	Total		**1,65,000**

* No objection certificate may be obtained from the concerned State Pollution Control Board

Other Equipment

Sl. No.	Particulars	Amount
1	Erection and Electrification @ 10% of cost of Machinery and Equipment	16,500
2	Office furniture and fixtures	30,000
3	Total	**46,500**

COST OF THE PROJECT

Sl. No	Particulars	Cost (Rs.)
1	Land & building rent	4,50,000
2	Plant & Machinery	1,65,000
3	Other equipment	46,500
4	Contingencies @2% of the project	10,000
5	Pre-operative cost	50,000
	Total	**7,21,500 (Rounding to 7.22 lakh)**
	Loan Amount 75%	**5.42 lakh**

IMPLEMENTATION SCHEDULE

Project Stages	Months……					
	1	2	3	4	5	6
Acquisition of Land						
Ordering of Machinery						
Delivery of Machinery						
Term/Wkg Loan Sanction						
Installation of Machinery						
Commissioning of Plant						
RM/Inputs Procurement						
Manpower Appointments						
Commercial Production						

INSTALLED CAPACITY & CAPACITY UTILIZATION

The installed capacity of the unit is 200 MT per year. There are 5 cycles in a year. Each cycle takes around 75 days. The capacity utilization of 40%, 80% and 90% has been considered during first, second and third year onwards respectively.

SALES REVENUE

Particulars	Rate per ton (INR)	Sales (INR Lakh)
Vermi compost (300 MT)	5000	15.00
Total Sales		15.00

WORKING CAPITAL ASSESSMENT (per month)

Particulars	**Value (in INR lakh)**
Manpower	4.80
Raw materials	4.80
Utilities (Electricity, oil, grease, water, etc.)	0.46
Contingencies	0.10
Total	**10.16**

TOTAL CAPITAL INVESTMENT

Particulars	Value (in INR lakh)
Fixed capital	7.21
Working capital for 3 months	3.50
Total	10.71

PROFITABILITY CALCULATION

Sl. No.	Particulars	Rate per ton (INR)	1st year	2nd year	3rd year	4th year	5th year
	Total Capacity: 300 ton						
A	Income						
	Capacity Utilization	-	70%	80%	90%	90%	90%
	Production (MT)		210	240	270	270	270
A1	Vermi Compost	5000	1050000	1200000	1350000	1350000	1350000
B.	Cost of production per annum						
B1	Raw Materials*		480000	405000	405000	405000	405000
B2	Cost of utilities		46000	46000	46000	46000	46000
B3	Manpower		480000	480000	480000	480000	480000
B4	Office & Marketing expenses		70000	70000	70000	70000	70000
	Total of Cost of Production		1076000	1001000	1001000	1001000	1001000
C	Net Profit (before tax)		-26000	199000	349000	349000	349000

*Exclude the cost of mother earth worm from 2nd year onwards

BREAK EVEN POINT ANALYSIS

Break-even point

$$\frac{Annual\ Fixed\ Cost X100}{Annual\ Fixed\ Cost + Profit} = \%$$

Sl. No.	Particulars	Amount (in INR Lakh)
A	Annual Fixed Cost	
1	Interest (@ 10%)	0.54
2	Depreciation on machineries	0.17
3	Depreciation on furniture	0.3
4	40% of salary, wages, utilities, contingencies	1.92
5	Insurance	0.10
	Total Annual Fixed Cost	3.03
6	Break Even Point	55%

References

- **Report vermicompost by Agri clinics & agri business centres**
- **KVIC Report for vermicompost**
- **Vermi-Compost article**

  https://www.agricultureinformation.com/forums/threads/project-report-on-vermicompost-unit.93045/

Video Link -Vermi-compost

https://youtu.be/_qxO634w924

MANUFACTURES/ SUPPLIERS OF MACHINERY

Raw Materials are locally available.

STATUTORY/ GOVERNMENT APPROVALS

MSME & GST registration, and local authority clearance may be required for Shops and Establishment, PF and Labour laws may be required if applicable.

DISCLAIMER:

This is an indicative illustration of project profile; the above calculation can vary with the locations.

DISCLAIMER: