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Business feasibility of vermicompost units in Telangana and way forward

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Abstract

Vermi-biotechnology is an eco-friendly, socially sound and economically viable innovative technology to manage the organic waste resources on low capital input basis. It also increases soil's physical, chemical and biological characteristics through organic enrichment of soil. Vermiculture become an important component of organic farming because of the increased awareness towards organic farming and Government's continuous effort. While, to create favorable environmental for vermicompost production enterprises and to understand its potential, business feasibility of vermicompost unit was studied. Based on the findings of the study, it was found that, the total production cost of vermicompost was Rs.3,95,500; the total marketing cost was Rs.64,800 and the total returns from 280 tonnes of vermicompost was Rs.14,01,250. In addition, the BC ratio was 1.80 which indicates that vermicompost unit is a profitable and financially feasible enterprise. Further, it was observed that Government should conduct trainings and awareness campaigns to expose the benefits of vermicompost among farmers. Hence, it was suggested that Government should establish a proper market place for vermicompost to promote the marketing of vermicompost.

Keywords: Business feasibility, vermicompost units, sustainable agriculture, organic farming

Introduction

Rapid growth in Indian population greatly affected the agricultural system to increase its production and productivity as most of the people died of severe hunger. In this connection, chemical fertilizers were introduced to boost the crop growth and yield. But, nowadays, increase use of pesticides and chemical fertilizers has resulted in degrading the soil fertility, increased resistance among pest and questions the sustainability. Further, there would be a shortfall in production of chemical fertilizers in the next decade which need to be bridged by tapping the potential of organic fertilizers. In order to overcome the ill-effects of using chemical and inorganic fertilizers, recycling of agricultural and organic waste through vermicomposting technique can reduce environmental pollution and increase the soil fertility.

Prasanthrajan *et al.* (2006) ^[13] reported that, more than 2500 MT of organic waste in India were converted into organic manure for agricultural purposes. Since the vermicomposting technology facilitates conversion of biodegradable waste into nutrient-rich organic manures and ensures good and hygiene environmental condition, Indian Department of Science and Technology promoted the adoption of vermicompost technology in 13 states of India.

In Layman's language, 'vermi' means earthworms and 'culture' means farming i.e., farming of earthworms.

Vermicompost are finely-divided earthworm castings, produced as a result of combined effect of enzymatic activity and grinding of organic materials to fineness by earthworms (NABARD, 2019) ^[5]. Vermicompost plays a crucial role in replacing the chemical fertilizer and minimizing organic pollution (Shivakumar *et al.*, 2009) ^[8] as its soil's physical, chemical, and biological characteristics leads to organic enrichment of soil and fetch higher prices for the producer (Singh *et al.*, 2013) ^[9]. Vermicompost is popularly known as 'gold from garbage'.

Several studies for years have revealed that vermicompost production was the most profitable venture (Biradar *et al.*, 2001; Tiwari, 2004; Das, 2005; Khadtare *et al.*, 2006; Chinnappa Reddy *et al.*, 2007; Shivakumar *et al.*, 2009; Viswanatha and Bindu, 2018; Soni and Patel, 2020 and Patel *et al.*, 2021) ^[1, 11, 3, 4, 2, 8, 12, 10, 6]. In addition, it was reported that vermicomposting is an environmental friendly way of increasing the crop yield (Perera and Nanthakumaran, 2015) ^[7].

To create viable vermicompost production enterprises at the village level, the present study aims to assess the business feasibility of vermicompost unit for better understanding of

the potential ability of the vermicompost units. Meanwhile, the Central and State Government has implemented numerous initiatives to promote organic agriculture. As vermicomposting is an important component of organic agriculture, it is the right time to evaluate the feasibility of vermicompost.

Methodology

Ex-post facto research study was conducted in three districts of Telangana viz., Rangareddy, Medak and Vikarabad since they were near to Hyderabad city and well connected to rural areas. From each district, three units were selected purposively for the study along with the unit located at National Institute of Rural Development and Panachayati

Raj (NIRD&PR), Rajendranagar, Hyderabad. Thus, in total, 10 vermicompost units were studied to assess the business feasibility. In addition, from each unit, 12 farmers or consumers were selected purposively, to assess the reason for not purchasing vermicompost. Data was collected through survey method and personal interview method with the help of a structured and pre-tested interview schedule. The data collected from the respondents were tabulated, categorized, analyzed with suitable statistical tools.

Findings and Discussion

Cost and returns of vermicompost production unit was studied and presented in Table 1.

Table 1: Cost and returns of vermicompost production

S. No.	Particulars	Quantity	Value (in Rs.)
I	Variable costs		
A	Material costs		
1	Agricultural waste and cow dung (Rs.100/tonnes)	60 tonnes	60,000
2	Earth worm (Rs.50000/tonnes)	0.5 tonnes	2,50,000
	Total material costs (A)		3,10,000
B	Labour costs		
1	Pit filling (Rs.400/person/day)	1 labour	12,000
2	Worm separation (Rs.400/person/day)	1 labour	12,000
3	Watering (Rs.400/person/day)	1 labour	12,000
4	Collection of waste (Rs.400/person/day)	1 labour	12,000
5	Sieving (Rs.400/person/day)	1 labour	12,000
	Total labor costs (B)		60,000
C	Interest on working capital		2,500
	Total variable cost (I =A+B+C)		3,72,500
II	Fixed costs		
1	Land rent		3,000
2	Working shed		15,000
3	Tools and machineries		5,000
	Total Fixed costs (II)		23,000
	Total production costs (I+II)		3,95,500
III	Marketing cost		
1	Plastic bags (Rs.4)	40 kg / bag	20,000
2	Packing (Rs.10/ton)	280 tonnes	2,800
3	Transportation cost (Rs.100/ton)	280 tonnes	28,000
4	Loading and unloading (Rs.50/ton)	280 tonnes	14,000
	Total marketing cost (III)		64,800
IV	Average Yield	280 tonnes	14,00,000
V	Selling price		
1	Vermicompost (Rs.500/tonnes)	280 tonnes	14,00,000
2	Earthworm (Rs.50/kg)	0.25 tonnes	1,250
	Total selling price		14,01,250
VI	Gross returns		14,01,250
VII	Net returns (VI-I-II-III)		9,40,950
VIII	B:C ratio		1.80

From Table 1, it could be understood that the total material cost involved in vermicompost production was Rs.3,10,000 that includes agricultural waste and cow dung (Rs.60,000); earth worm culture (Rs.2,50,000). While, total labor costs was Rs.60,000 which includes labour cost of Rs.400/person/day for pit filing (Rs.12000), worm separation (Rs.12000) m watering (Rs.12000), collection of waste (Rs.12000) and sieving (Rs.12000). Thus, the total variable cost was Rs.3,72,500 which includes the interest on working capital of Rs.2500.

Simultaneously, the total fixed cost was found to be

Rs.23,000 inclusive of land rent (Rs.3000) working shed (Rs.15,000) and tools and machineries cost (Rs.5,000). The total production cost was Rs.3,95,500 for an average yield of 280 tonnes. Eventually, the total marketing cost was observed as Rs.64800 which consists of plastic bag (Rs.20,000); packing cost (Rs.2800); transportation cost (Rs.28,000) and loading and unloading charges (Rs.14,000). Vermicompost was sold at Rs.500 per ton and earthworm culture was sold at Rs.50 per kg which would earn the vermicompost producer Rs.14,01,250. Thus, the gross returns and net returns of a vermicompost unit was found to

be Rs.14,01,250 and Rs.9,40,950 respectively. The financial feasibility of vermicompost unit based on NPV, BC ratio and IRR was studied and presented in Table 2.

Table 2: Financial feasibility of vermicompost units

S. No.	Particulars	Value
1	Net Present Value (15% discounting rate)	Rs.10,05,950
2	B:C ratio	1.80
3	Internal Rate of Return	75%

Table 3: Distribution of vermicompost customers based on their reasons for not purchasing vermicompost (N=120)

S. No.	Reasons for not purchasing or using vermicompost	Response					Total
		Strongly disagree	Disagree	Undecided	Agree	Strongly Agree	
1	Lack of awareness	0 (0.00)	2 (1.67)	10 (8.33)	49 (40.83)	59 (49.17)	120 (100.00)
2	Less product reliability	0 (0.00)	2 (1.67)	51 (42.50)	58 (48.33)	9 (7.50)	120 (100.00)
3	Not available in the market	5 (4.17)	37 (30.83)	66 (55.00)	10 (8.33)	2 (1.67)	120 (100.00)
4	High price	33 (27.50)	56 (46.67)	21 (17.50)	8 (6.67)	2 (1.67)	120 (100.00)
5	Use home made organic inputs	63 (52.50)	24 (20.00)	26 (21.67)	2 (1.67)	5 (4.17)	120 (100.00)

Note: Figures in parenthesis indicates percentage to the total number of farmers

From Table 3, it was understood that, higher percentage of the farmers strongly agreed that they lack awareness on the benefits of vermicompost (49.17%) followed by 7.50 per cent of farmers revealed about less product reliability, 1.67 per cent of farmers revealed about unavailability in market and high price of the vermicompost and 4.17 per cent revealed about using of homemade organic inputs.

This is because of farmers failed to realize the benefits of using vermicompost as it enhances the soil quality slowly. In addition, farmers lack knowledge towards the quality of vermicompost and lack of studies on demand and supply of vermicompost results in lack of product in the market during demand and high price for the regular purchasers. Eventually, use of homemade organic inputs acts as an alternate input so they prefer vermicompost lesser since quality and brand of the vermicompost are not reliable and credible.

Conclusion

As vermicomposting technology can be a beneficial solution to tackle problems in both solid waste management and expensive agricultural inputs, it was important to assess the financial feasibility of vermicompost units. The financial feasibility of vermicompost units, which implies that NPV of a vermicompost unit for a period of 15 years was Rs.10,05,950 with a Benefit cost ratio of Rs.1.80 and IRR of 75%. The findings indicate that vermicompost unit is a profitable business venture that generates an additional income of 0.80 rupees on investment of 1 rupee. In addition, they observed that farmers do not purchase vermicompost frequently as they lack awareness of the benefits of vermicompost (49.17%). Hence, Government should conduct trainings and awareness campaigns to expose the benefits of vermicompost among farmers. As there is lack of research on demand and supply of vermicompost, hence studies on demand and supply of vermicompost need to be studied. Further, there is no proper marketplace for vermicompost, a market model can be developed based on the marketing channel identified in the study.

Table 2. depicts the financial feasibility of vermicompost units, which implies that NPV of a vermicompost unit for a period of 15 years was Rs.10,05,950 with a Benefit cost ratio of Rs.1.80 and IRR of 75%. The findings indicate that vermicompost unit is a profitable business venture that generates an additional income of 0.80 rupees on investment of 1 rupee.

In order to promote vermicompost, the reasons for not purchasing vermicompost should be understood. In this regard, reasons for not purchasing were studied and presented in Table 3 and Fig.1.

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