

Original Research Article

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An Economic Analysis of Production and Marketing of Vermicompost in Balod District of Chhattisgarh

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ABSTRACT

Keywords

Vermicompost, respondents, net income, per cubic meter, benefit-cost ratio, reproductive species, earthworm (*Eisenia fetida*), producer-government agencies-consumer channel

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Vermicompost is a biotechnological system. In which earthworms of a specific species are used to convert dung or waste materials into organic materials. Which leads to a great product. Vermicompost's essential ingredients are externally low cost. After which the best products are obtained. The state of Chhattisgarh comprises 28 districts, out of these 28 districts, Balod district comprises 5,669 SHGs and 859 SHG's in Dondi Lohara, which is 15.15% of the total district of SHGs and hence Balod district will be deliberately selected for the study. There are 5 blocks in Balod district, namely Balod, Dondi, Dondi Lohara, Gunderdehi and Gurur 1 block out of 5 blocks i.e. Dondi Lohara block will be selected from the district as it represents the nearest area from my village. It is observed that an average production of 3.28 quintals per cubic meter is usually done in 3 cycles. The net income per cubic meter at the total cost was Rs. 1520.49. The benefit-cost ratio per cubic meter was 1: 0.61. The total cost per quintal production of vermicompost was Rs 2458.92. Most of the groups are using earthworm (*Eisenia fetida*) which is highly reproductive species, due to which its use and demand. It was observed that the producer-government agencies-consumer channel has the highest marketing usage compared to others.

Introduction

Vermi culture enterprise is a relatively new enterprise that is spreading rapidly among women in rural areas. As the vermin culture enterprise is less expensive in terms of costs and relatively more intensive in terms of labour, it provides them with relatively fair employment with less investment.

Vermiculture (from Latin vermes– worms, and culture – farming) has been practiced for at least a hundred years.(Vig. *et al.*, 2005).Earthworms are the inhabitants of earth since pre-Cambrian era, i.e.; about 600 million years ago. They are terrestrial invertebrates belonging to the Order Oligochaeta, Class Chaetopoda, Phylum Annelida (Pearce *et al.*, 1990). This emerging technology is highly

dependent on the efficiency of earthworms. Thus utilization of vermiculture is one of the important parts to be considered, Vermiculture referred to as the development of mass earthworm culture on compostable or decomposable organic matter. Approximately 4,400 different species of earthworms have been identified worldwide; *Eudrillus eugeniae* and *Eisenia foetida* are being used as composting earthworms in most of the countries. *Eisenia foetida* is perhaps world's most widely used earthworm for vermicomposting (Krishnamurthy R V et al, 1986). The role of earthworm in composting procedure had been mentioned by Charles Darwin (1881) in his book „Formation of Vegetable Mould. Earthworms are an important link in the food chain of many invertebrate and vertebrate animals (Macdonald 1983).

Materials and Methods

The state of Chhattisgarh comprises 28 districts, out of these 28 districts, Balod district comprises 5,669 SHGs and 859 SHG's in Dondi Lohara, which is 15.15% of the total district of SHGs and hence Balod district will be deliberately selected for the study.

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Primary Data

Primary data were collected from the sample vermin-compost producers through survey method and personal interview with the help of pre-tested well prepared interview schedules covering various aspects to answer the objectives of this study. The primary data recorded regarding socio-economic

characteristics of the vermin-compost producers, farm assets, fixed and variable cost of Vermi-compost production, operation wise labour utilization, total quantity sold, price of vermi compost, agency to whom sold, place of sell and expenditure incurred during marketing of produce etc.

Secondary Data

The secondary data were collected through various sources like Janpad panchayat Government Site, SHG groups and other Non-Government organization.

Method of Analysis

The information collected from the respondents were edited for adequacies and accuracies and cross examined before they were subjected to tubular analysis. The primary data were classified and tabulated in the light of stated objectives of the study and analyzed as per the suitable statistics and economic tools as follow.

Cost concept

Cost Related To Vermi-compost Production

Cost of cultivation

Cost of cultivation = Total Fixed Cost + Total Variable Cost

Fixed cost

Fixed Cost are remaining constant and do not varies with level of production. To calculate fixed cost of production, various cost components are taken into consideration.

Variable cost

It includes cost of cow dung, earthworm cost, water and electricity charge, labour cost, miscellaneous cost.

Profitability Concept

Gross Income

It is defined as total value of main product

Gross Income = Physical Production x Price/qt

Net Income

It is defined as gross income minus total cost

Net Income = Gross Income - Total Cost

Input – Output Ratio

Input - Output Ratio = Gross Income/Total Cost

Benefit – Cost Ratio

Benefit – Cost Ratio = Net Income/ Total Cost.

Results and Discussion

To workout cost and returns of vermi compost

Cost of vermi compost(Rs/Quintal)

Item wise expenditure of vermi compost production was calculated and are presented in Table 4.2. The variable cost are cost that change as the quantity of the good or services that a business produces changes. The total variable cost of Unit-A, Unit-B and Unit-C are Rs.716.89, Rs. 751.67 and Rs. 762.08 Respectively. Total fixed costs include those expenses that do not change within the relevant period as a function of a business's activity. No fixed cost due to government subsidies in all clusters. Whereas, the total cost of Unit-A, Unit-B and Unit-C is Rs

716.89, Rs 715.67 and Rs 762.08. respectively. The total average cost of different physical inputs for units as per the data is Rs.116.59 for culture (*Eisenia fetida*), Rs.392.85 for cow dung, Rs. 1.02 for electricity & water, Rs. 144.11 for labor charge, Rs.46.88 for packaging cost, and Rs. 42.07 for Miscellaneous cost.

Gross income is the amount a business earns from the sale of goods or services, before selling, administrative, tax and other expenses have been deducted. The main product income is Rs.1000 and earthworm (*Eisenia fetida*) sales income is Rs.176.76, Rs.226.75 and Rs.198.41 in Unit-A, Unit-B and Unit-C respectively. The gross income for Unit-A, Unit-B and Unit-C is Rs.1176.75, Rs.1226.75 and Rs.1198.41 respectively. The input-output ratios of Unit-A, Unit-B and Unit-C are 1:1.64, 1:1.63 and 1:1.57 respectively.

Net income is the amount left after subtracting all costs and expenses from revenue. The net income of Unit-A, Unit-B and Unit-C is Rs.459.87, Rs.475.08, and Rs.436.33 respectively. The Net Profit – Cost Ratio of Unit-A, Unit-B and Unit-C are 1:0.64, 1:0.63 and 1:0.57 respectively. The total average of Gross Income, Input-Output Ratio, Net Income, Net Profit-Cost Ratio for the units is Rs.1198.41, 1:1.61, 455.79 and 1:0.61 respectively.

Total average cost and total average returns of vermi compost (Rs/Quinta)

The estimation revealed that the total raw material quantities in Unit-A, Unit-B and Unit-C were 990 quintal, 630 quintal and 630 quintal respectively. In which the total product quantity received in Unit-A, Unit-B and Unit-C were 396 quintal, 220.50 quintal and 252 quintal respectively.

Table.1 Total cost, gross income and net income of vermi compost production (Rs/ quintal)

Particulars	Unit-A	Unit-B	Unit-C	Average
Variable Cost				
Culture (<i>Eisenia fetida</i>)	121.21	95.23	133.33	116.59
Cow dung	375	428.57	375.00	392.85
Electricity & water charges	0.50	1.58	0.99	1.02
Lebour charge	128.78	161.90	141.66	144.11
Packaging cost	48.48	32.65	59.52	46.88
Miscellaneous cost	42.92	31.74	51.58	42.07
Total variable cost (A)	716.89	751.67	762.08	742.62
Fixed Cost				
Construction Cost	-	-	-	-
Depreciation cost	-	-	-	-
Total fixed cost (B)	-	-	-	-
Total Cost (A+ B)	716.89	751.67	762.08	742.62
Main product return	1000	1000	1000	1000
Earthworm sale (<i>Eisenia fetida</i>)	176.76	226.75	198.41	198.41
Gross Income	1176.76	1226.75	1198.41	1198.41
Input-output Ratio	1:1.64	1:1.63	1:1.57	1:1.61
Net Income	459.87	475.08	436.33	455.79
Benefit-Cost Ratio	1:0.64	1:0.63	1:0.57	1:0.61

Fig.1 Total cost and net income of vermi compost production (Rs/quintal)

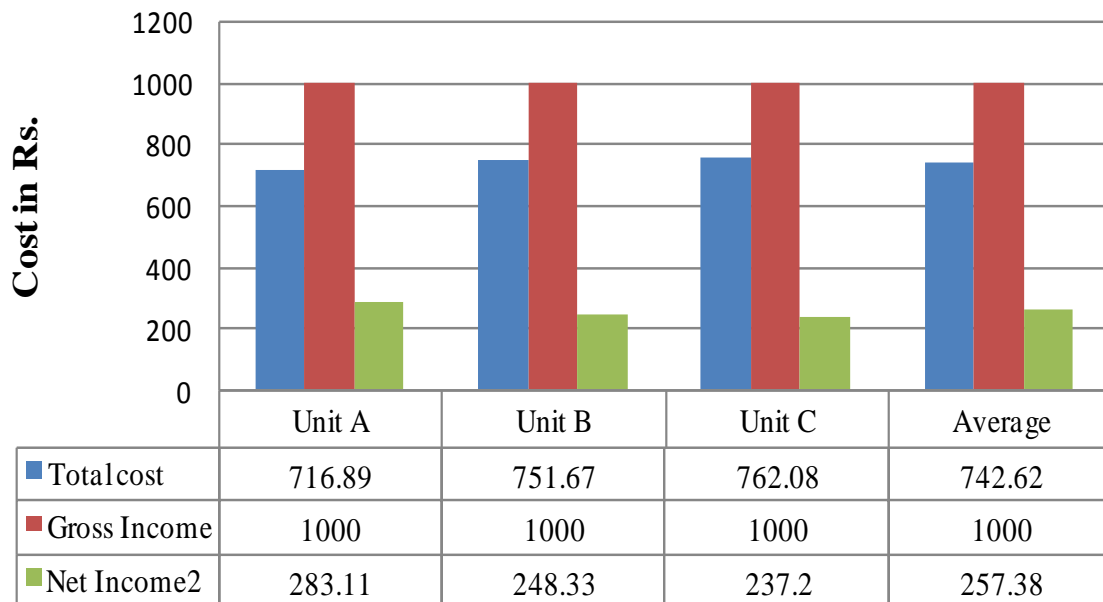


Table.2 Total average cost and total average returns of vermi compost (Rs/Quinta)

Unit – A						
	Quantity /pit (Qt)	Rate/ Qt(Rs.)	Total quantity(Qt)	Total amount (Rs)	Gross return (Rs.)	Net income (Rs)
Total Cost (Rs)	2,83,900					
No of pit(Tank)	30					
Row Material (Qt)	33.00	150	990.00	1,48,500		
Production, 400g/Kg	13.20	1000	396.00	3,96,000	4,66,000	1,82,100
Earthworm sale (Rs.)	-	200	3.5	70,000		
Unit – B						
	Quantity /pit (Qt)	Rate/ Qt(Rs.)	Total quantity(Qt)	Total amount (Rs)	Gross return (Rs.)	Net income (Rs)
Total Cost (Rs)	1,59,750					
No of pit(Tank)	21					
Row Material	30.00	150	630.00	94,500		
Production,350g/Kg	10.50	1000	220.50	2,20,500	2,70,500	1,10,750
Earthworm sale		200	2.5	50,000		
Unit – C						
	Quantity /pit (Qt)	Rate/ Qt(Rs.)	Total quantity(Qt)	Total amount (Rs)	Gross return (Rs.)	Net income (Rs)
Total Cost (Rs)	1,,92,050					
No of pit(Tank)	21					
Row Material	30.00	150	630.00	94,500		
Production,400g/Kg	12.00	1000	252.00	2,52,000	3,02,000	1,09,950
Earthworm sale		200	2.5	50,000		
Average						
	Quantity /pit (Qt)	Rate/ Qt(Rs.)	Total quantity(Qt)	Total amount (Rs)	Gross return (Rs.)	Net income (Rs)
Total Cost (Rs)	2,13,899.99					
No of pit(Tank)	24					
Row Material	31.00	150	744.00	1,11,600		
Production, 383.85g/Kg	11.90	1000	285.60	2,89,500	3,46,166.66	1,32,266.66
Earthworm sale		200	283.33	56,666.66		

Table.3 Total Net income of per capita/year/day (Rs.)

S.No.	Particular	Unit-A	Unit-B	Unit-C	Average
1.	Working day	20	20	20	20
2.	Total compost cycle	3	3	3	3
3.	Total working day	60	60	60	60
4.	No of labor	8	10	5	7.67
5.	Total day of work through total labor	480	600	300	460
6.	Total net income	1,82,100	1,10,750	1,09,950	1,32,266.66
7.	Net income/capita/year	3,035	1,845.83	1,832.50	2,204.44
8.	Net income/capita/day	379.38	184.58	366.50	287.5

Fig.2 Total average cost and total average returns of vermi compost in quintal

Total Row material and total Production in quintal

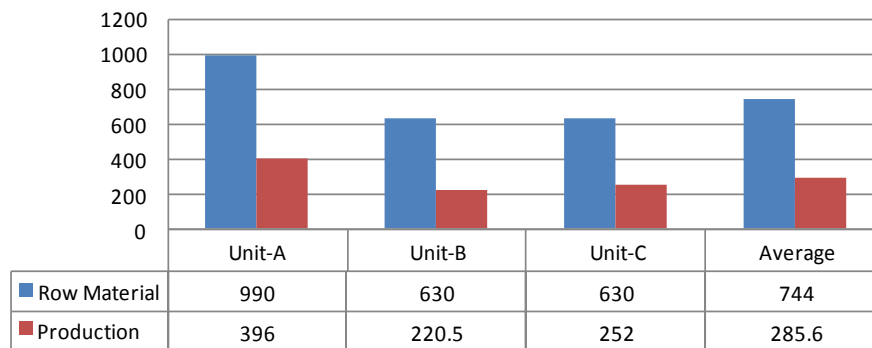
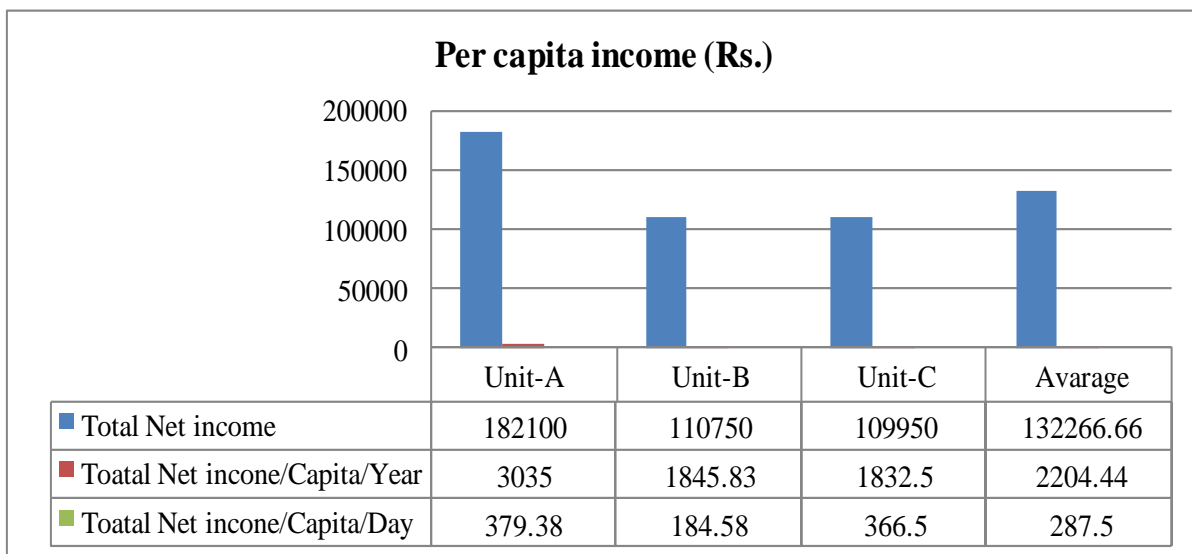


Fig.3 Total Net income of per capita/year/day (Rs.)



The total average raw material quantity in the calculation obtained was 744 quintals and the total average product of raw materials was 285.60 quintals. The details of which are given in Table 4.3.

Total Net income of per capita/year/day (Rs.)

From the calculations it was found that the annual per capita income in the groups Unit-A, Unit-B and Unit-C respectively is Rs.3035,1845. Rs. 1832. Rs. and unit-A, unit-B and unit-C of unit-A, unit-B and unit-C in per capita income of Rs.379. Rs.184. and Rs.366. respectively. Full details of which are in Table 4.4. The total cost per quintal production of vermi compost was Rs. 742.62

The average main product returns was Rs.1000 and earthworm (*Eisenia fetida*) sale return was Rs.198.41.

The net income per quintal vermi compost production at the total cost was Rs 455.79. The average profit-cost ratio per quintal was (1: 0.61).

Suggestions

Establishment of high quality earthworm production units in clusters and availability of best quality species such as red wigglers (*Eisenia fetida*) and redworm (*Lumbricus rubellus*). Adequate financial support will be provided by state-run banks or other financial institutions under initial vermicompost

construction.

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