



ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(12): 1474-1476
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www.thepharmajournal.com

Received: 11-10-2021
Accepted: 18-11-2021

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Vermicomposting for income generation by farm women in Umaria district, Madhya Pradesh

Vinita Singh, KP Tiwari and K Muwel

Abstract

Vermicomposting is a process of turning organic debris into worm castings. These castings are known for high amounts of nitrogen, potassium, phosphorus, calcium and magnesium and have excellent aeration, porosity, water holding capacity etc. The present study was carried out in the village Tali of Umaria district by Krishi Vigyan Kendra with the objective to demonstrate the management of bio waste through vermicomposting for income generation. Training on various aspects of vermicompost production was provided to 40 farm women, out of which a total of 10 women who showed their interest were selected for vermicompost production. Data on their socio-economic aspect was taken prior to the study. Then a training on vermicompost production technology was imparted to them. Their knowledge in this aspect was checked before and after training. After that, under frontline demonstration HDPE made vermicompost bags of size 12x4x2 ft and 1 kg earthworm of species *Eisinea foetida* was given to the beneficiaries for vermicompost production. Data obtained showed that farm women possessed low level of knowledge on vermicompost production before training which increased after attending training programme. Average yield of vermicompost and worms obtained per year per unit was 4.172 tonnes and 6 kg respectively with a gross average income Rs. 31004 and B:C ratio 4.04.

Keywords: *Eisinea foetida*, vermicompost, income generation

Introduction

The existence of women in a state of economic, political, social and knowledge disempowerment is known to be a major hindrance to economic development. Income generating activities are considered as those initiatives that affect the economic aspects of people's lives through the use of economic tools. There are a number of agriculture based enterprises that can be practiced by women, effectively utilizing the leisure time available to them. But it becomes important to select an enterprise which does not require any major investment. Vermicompost production is one of the most feasible agri-business activity which generates employment and income (Kusum, 2005 [6], Baraskar *et al.* 2018 [1] and Yangchan *et al.* (2019) [11], and can empower rural women socio-economically (Hamdani *et al.* 2020) [5].

Vermicomposting is the term given to the process of conversion of biodegradable matter by earthworms into vermicast. Vermicast is popularly known as Black gold since it is rich in nutrients, growth promoting substances, beneficial micro-flora, having properties of inhibiting pathogenic microbes and synergistic relationship in plant rhizospheres (Gomez-Brandon *et al.* 2008) [4]. In the process of vermicomposting, the nutrients contained in the organic matter are partly converted to bio-available forms. The technology is not intricate and involves a simple procedure of compost preparation, skills which can be easily learned and mastered by users.

Keeping the fact of low income and easy availability of cattle dung and agricultural bio waste to farm women into consideration, the present work was done with the objective to know the basic profile of the farm women to analyze their economic status, their knowledge level before and after training programme and performance of frontline demonstration on vermicompost production for income generation by selected farm women of Umaria district in Madhya Pradesh.

Materials and Methods

The present work was carried out by Krishi Vigyan Kendra, Umaria in adopted nutri- smart village, Tali of block Karkeli during the year 2019 and 2020. Initially a total of 40 women were selected for the training programme. All of them were actively engaged in unpaid agricultural practices as well as the collection of animal waste. First of all, data on their basic profile was collected which included the information regarding their caste, education, income, exposure to mass media etc.

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After that, training on vermi-compost technology was provided to them to ensure the adoption of recommended practices during production. Pre and post knowledge data of farm women was also collected with the help of a pre structured interview schedule. To increase their income, vermi-compost poly pits made of HDPE of size 12x4x2 ft was provided by Krishi Vigyan Kendra to 10 women under the activity of front line demonstration for establishment of unit in their backyards. This was filled with crop residues of wheat, gram, tree leaves etc. as per seasonal availability and cattle dung in layers in every 15 days to make a heap of decomposed organic matter for feeding of earthworms. After rotting of this mixture, one kg of earthworms counting approximately 350 in numbers were incorporated between the layers of decomposed material in the pit. The pit was then covered with gunny bags and regular sprinkling of water was done to maintain a moisture level approx. between 40 to 50% by the farm women. After 50-55 days, vermi-compost was prepared in the form of black tea like granules which was sieved to separate the worms from the compost. The worms were again used to continue the composting process with next prepared organic matter. This process continued round the year. Finally yield and economic data were obtained and analyzed for the study.

Results and Discussion

Basic profile of the farm women revealed that most of them belongs to other backward class (60%), literate (70%), working as agricultural labourer (57.5%), had per capita income between Rs. 1000-2000 (52.5%) and low exposure to mass media (55%) (Table1). It was reported by Ekatpure *et al.* (2011)^[3], that characteristics of the respondents like education, land holding, annual income, socio-economic status, source of information, social participation and extension contact had positive and significant relationship with participation level whereas age showed negatively significant relationship with participation in production of vermicompost.

Results obtained from pre and post training knowledge score presented in Table 2 indicates that most of the farm women did not have complete knowledge on vermi compost production prior to training. Only 5 to 24 percent farm women were found familiar with various aspects of vermi-composting. After conduction of training, their knowledge increased up to 85 to 100 percent. Parmar *et al.* (2014)^[7] also found medium level of knowledge on vermicompost

technology among the tribal beneficiaries of national agricultural innovation project under component- iii in banaskantha district, Gujarat. Improvement in knowledge on vermicompost production through training was reported by Varalakshmi *et al.* (2012) ^[10] in a study conducted on vermicompost as a micro enterprise to improve the economic status of Self help group women at Guntur District in the State of Andhra Pradesh. Singh *et al.* (2008) ^[8] revealed adoption gap in almost all recommended practices of vermi-compost production due to farmers’ poor knowledge or lack of skills in performing different practices recommended by scientists. Table 3 showed the data on yield and economic performance of the vermicompost production prepared by farm women for income generation from bio waste. It is clear from the table that every poly pit of size 12x4x2 ft produced a mean of 4.172 tonnes of vermicompost per year along with an average of 6 kg of worms. The annual average cost of input was Rs. 7670 per poly pit which gave a total of mean net income of Rs. 23334/ poly pit/year to every farm women with a B: C ratio of 4.04. In accordance, Singh *et al.* (2016) ^[9] in a study reported average gross return, net return and B:C ratio of Rs. 36575, Rs. 28158 and 4.34 respectively through vermicompost production in 6x3x3 feet poly pit. Dhanushkodi and Porkodi (2018) ^[2] also revealed a net annual earning of Rs.1,15,500/- through the sale of vermicompost and vermi worms and generating an additional employment of 426 man-days per year by a farmer of Kodukoor village in Cuddalore district after attended the vocational training on vermicomposting organized by ICAR- KVK Cuddalore.

Table 1: Basic profile of the respondents (N=40)

Particulars		Number	Percent (%)
Caste	General	04	10.0
	OBC	24	60.0
	ST	12	30.0
Education	Illiterate	12	30.0
	Literate	28	70.0
Occupation	Housewife	15	37.5
	Employed	02	5.00
	Others	23	57.5
Per capita income(Rs./month)	<1000	16	40.0
	1000-2000	21	52.5
	>2000	03	7.50
Exposure to mass media	Low	22	55.0
	Medium	12	30.0
	High	06	15.0

Table 2: Pre and post training knowledge of farm women regarding vermicompost production

Particulars	Knowledge of farm women(N=40)			
	Before training		After training	
	n	%	n	%
Importance of vermicompost in agriculture	04	10.0	40	100.0
Process for preparation of vermicompost	03	7.5	36	90.0
Appropriate location for installation of poly pits	07	17.5	38	95.0
Input requirements for vermicompost preparation	04	10.0	35	87.5
Use of agricultural waste and cattle dung in layers on beds	06	24.0	39	97.5
Water application through sprinkling on filled beds regularly for decomposition and maintaining temperature & humidity after placing earthworms	03	7.5	38	95.0
Filling of beds to a recommended level	02	5.0	40	100.0
Cleanliness of beds and surroundings	07	17.5	40	100.0
Duration required for preparation of vermicompost	03	7.5	38	95.0
Separation of vermicompost and earthworms	04	10.0	40	100.0
Keeping vermicompost for 3-4 days in heap before storage	02	5.0	36	90.0
Suitable Packaging for marketing and storage	02	5.0	34	85.0
Application of vermicompost in crops	02	5.0	35	87.5

Table 3: Production of vermicompost and worms in HDPE polybags (per unit/ year) under frontline demonstration

Year	No. of locations	Production/unit/ year		Cost of input/unit (Rs.)	Gross return (Rs.)			Net return (Rs.)	B:C ratio
		Vermi-compost (tonnes)	Worms (kg)		Vermi compost	Worms	Total		
2019	05	4.040	06	7670	28280	1800	30080	22410	3.92
2020	05	4.304	06	7670	30128	1800	31928	24258	4.16
-	10	4.172	06	7670	29204	1800	31004	23334	4.04

Sale rate of earthworm-Rs. 300/kg, Sale rate of vermicompost-Rs. 7/kg

Conclusion

It can be concluded from the above study that though the women participation in agriculture and household chores is tremendous but most of their works remain unpaid. It therefore becomes essential to engage them in such entrepreneurial activity which requires very less inputs and skills. Most of the women perform all the animal husbandry related work and handling of bio waste at least obtained from households. So, vermi composting can be a source for income generation because it is very low cost technique which can be easily adopted by farm women to upgrade their socio economic status. Apart from generation of additional income, the bio waste available can also be utilized in a proper manner through vermin composting. To improve the knowledge of farm women, trainings should be provided to them so that they can produce vermicompost in scientific and recommended manner.

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