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Analysis of Farmer Participation and Feedback on Vermicompost Training Programs at KVK Buxa, Jaunpur, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The study titled "Analysis of Farmer Participation and Feedback on Vermicompost Training Programs at KVK Buxa, Jaunpur" evaluates the outcomes of these programs in equipping farmers with the knowledge and skills required for effective vermicomposting. A structured questionnaire was administered to 125 participants, focusing on their socio-economic backgrounds, awareness levels, and perceptions of the program's impact. The research highlights the role of these training initiatives in promoting sustainable agricultural practices by enhancing participants' technical understanding and practical application of vermicomposting techniques. The study revealed that the majority of participants were middle-aged (35-50 years), predominantly from the Other Backward Classes (OBC) category and most had completed intermediate education. A significant portion of the participants was engaged in Agriculture, with marginal and small landholders being the largest groups. The study found that the key reasons for participating in the training included the desire for increased income opportunities (52.5%), followed by the adoption of organic farming practices (20%) and knowledge and skill development (15.3%). Suggestions for improving future training programmes included more practical sessions (28%), better government support and incentives (32%) and increased awareness campaigns on organic farming (24%). The study concludes that vermicomposting training programmes can significantly contribute to sustainable farming practices by enhancing farmers' skills, knowledge and income, with practical improvements needed in training delivery and support mechanisms.

Keywords: Vermicomposting; Krishi Vigyan Kendra; training program; knowledge enhancement; sustainable farming; organic farming; farmer education; impact assessment.

1. INTRODUCTION

Vermicomposting is an environmentally sustainable practice that utilizes earthworms to decompose organic waste into nutrient-rich compost, which can enhance soil fertility and improve agricultural productivity. It has gained significant attention in recent years due to its low-cost nature, minimal environmental impact and potential for transforming organic waste into valuable soil amendments (Dominguez, 2004). In India, where agriculture plays a central role in the economy, the adoption of such sustainable farming practices is essential to address challenges such as soil degradation, declining productivity and environmental pollution (Bandyopadhyay, 2013). One of the key approaches to promoting the adoption of vermicompost is through targeted training programmes that educate farmers about the benefits, techniques and applications of vermicomposting (Bhimawat et al., 2008; Kaur, 2002). These training programmes aim to bridge the knowledge gap and provide farmers with the skills required to implement vermicompost in their farming practices effectively (Prakash et al., 2024).

The Krishi Vigyan Kendra (KVK), Buxa, Jaunpur, has been at the forefront of organizing such training programmes to improve the adoption of sustainable agricultural practices among local farmers. With a focus on vermicompost, these programmes aim to educate farmers about the preparation of vermicompost, its application in enhancing soil health and its role in increasing crop productivity in a cost-effective and environmentally friendly manner (Khan, 2023; Sunil, 2006). Research has shown that the adoption of organic farming and composting techniques can significantly improve soil health, increase crop yields and provide a sustainable alternative to chemical fertilizers, which have detrimental effects on the environment (Das & Mishra, 2002). Moreover, the use of organic fertilizers like vermicompost has been linked to improved water retention, increased microbial activity in soil and better plant growth, all of which contribute to sustainable agricultural practices (Modi *et al.,* 2008).

Despite the clear benefits of vermicompost, the adoption rate among farmers has remained slow, often due to a lack of awareness, practical knowledge and technical skills (Timbadia et al., 1993). Previous studies have highlighted the need for comprehensive training programmes that combine theoretical knowledge with practical demonstrations to ensure effective learning (Joshi, 2004). Such training not only informs farmers about the benefits of vermicompost but also provides them with the necessary skills to implement these practices in their fields. This can

help address critical issues such as low soil fertility, high input costs and environmental degradation caused by chemical fertilizers (Swetha *et al.,* 2020).

In this context, the present study aims to assess the impact of the vermicomposting training programmes conducted at KVK Buxa, Jaunpur, on farmers' knowledge, skills and practices. The study evaluates the socio-economic profile of the participants, their reasons for participation and the outcomes of the training in terms of knowledge enhancement and adoption of vermicompost practices. The study also explores the trainees' suggestions for improving the training programmes and enhancing their impact. Understanding the factors influencing the effectiveness of such training programmes is crucial for formulating strategies to improve their reach and success. Furthermore, the findings of this study can contribute to the development of more targeted, practical and impactful training initiatives that encourage the widespread adoption of sustainable farming practices across India.

2. METHODOLOGY

The study was conducted at Krishi Vigyan Kendra (KVK), Buxa, Jaunpur, with a sample size of 125 respondents. A structured questionnaire was designed to capture the socio-economic profile of the participants and assess their knowledge about vermicomposting, including its preparation methods and applications. A pre-test was administered to evaluate the participants' initial understanding of vermicomposting techniques. To measure the training's impact, a set of questions focusing on the significance, practical applications and benefits of vermicomposting was included. The impact assessment was determined by calculating the difference in scores obtained by the participants before and after the training. Suggestions from the participants were collected to identify areas for improvement in future training programmes.

The data were systematically tabulated and analyzed using statistical tools such as frequency, percentage and ranking to derive meaningful insights and prioritize areas of concern. This methodology ensured a comprehensive evaluation of the training's effectiveness and helped formulate strategies for its enhancement.

3. RESULTS AND DISCUSSION

The findings from the current study and pertinent discussions have been compiled under the following headings:

Table 1. Socio-economic Profile of Trainees (n=125)

S. No.	Particulars	Categories	Frequency	Percentage (%)
1.	**Age**	Up to 35 years	23	18.5
		35-50 years	77	61.5
		Above 50 years	25	20.0
2.	**Social Category**	General	38	30.5
		OBC	59	47.5
		SC/ST	29	23.0
3.	**Education**	Primary	15	11.7
		Secondary	24	19.0
		Matriculate	22	17.2
		Intermediate	31	25.0
		Graduate	24	19.1
		PG + Others	10	8.0
4.	**Occupation**	Agriculture	46	36.7
		Agriculture + Business	32	25.8
		Agriculture + Pvt. Job	25	20.0
		Housewife	21	16.5
		Others (Retiree, Student)	15	12.0
5.	**Landholding**	Landless	21	16.7
		Marginal (<1 ha)	41	32.5
		Small (1-2 ha)	39	30.8
		Semi-medium (2-4 ha)	13	10.0
		Medium (4-10 ha)	11	8.5

S. No.	Particulars	Categories	Frequency	Percentage (%)
		Large (>10 ha)	3	2.5
6.	**Income**	Low (<150,000)	80	64.0
		Medium (150,000-185,000)	32	25.8
		High (>185,000)	13	10.2

Age: The age profile of the trainees reveals that the majority (61.5%) were aged between 35 to 50 years, followed by 20% above 50 years and 18.5% under 35 years. This indicates that middle-aged individuals, typically more engaged in agricultural activities and decision-making, formed the largest group of participants. Their participation suggests a keen interest in adopting sustainable agricultural practices like vermicomposting to improve farm productivity. Similar results were also reported by Swetha et al. 2020.

Social Category: The Social Category composition shows that the majority (47.5%) belonged to the Other Backward Classes (OBC) category. This was followed by 30.5% from the General category and 23% from Scheduled Castes and Scheduled Tribes (SC/ST). The significant representation of OBC and SC/ST categories highlights the inclusivity of the vermicomposting training programs, ensuring that economically and socially marginalized groups gain access to sustainable agricultural practices. Similar results were also reported by Tiwari et al. 2020.

Education: Education levels varied significantly among the trainees. While 25% had completed intermediate education, 19.1% were graduates and 8% had postgraduate qualifications. A notable proportion (11.7%) had only primary-level education. The relatively high number of educated participants suggests that the training programmes attracted individuals with the capacity to grasp and implement technical concepts. However, the presence of less-educated participants highlights the need for simplified training methodologies to ensure effective learning across all educational levels. Similar results were also reported by Swetha et al. 2020.

Occupation: The occupational data reveal that the largest group of participants (36.7%) were primarily engaged in agriculture, reflecting the training program's primary focus on farmers. Additionally, 25.8% were involved in both agriculture and business, indicating a growing trend of diversification among farmers to enhance income opportunities. A smaller but notable proportion (20.0%) combined agriculture with private jobs, showcasing the dual livelihood strategies employed by many rural households. The inclusion of 16.5% housewives and 12.0% retirees or students suggests that the training programs are not limited to conventional farmers but also extend to non-traditional participants, promoting broader awareness of vermicomposting across various demographic groups. This diversity underscores the program's success in appealing to a wide audience and encouraging sustainable agricultural practices across multiple societal roles. Similar results were also reported by Tiwari et al. 2020.

Landholding: The landholding distribution shows that most participants (32.5%) were marginal farmers owning less than 1 hectare of land, followed by 30.8% who were small landholders (1-2 hectares). A smaller proportion had medium (8.5%) or large holdings (2.5%), while 16.7% were landless. This suggests that the training was particularly beneficial for marginal and small-scale farmers, who are more likely to benefit from cost-effective practices like vermicomposting to improve soil fertility and crop yields. Similar results were also reported by Tiwari et al. 2020.

Income: Income analysis indicates that the majority (64%) of participants belonged to the low-income group (<150,000 annually), followed by 25.8% in the medium-income group (150,000-185,000) and 10.2% in the high-income group (above 185,000). The predominance of low-income farmers underlines the importance of such training programmes in addressing the needs of economically weaker sections, enabling them to adopt cost-effective technologies to enhance farm income. Similar results were also reported by Patel et al. 2015.

The analysis of reasons for participation in vermicompost training programmes revealed that the primary motivator for respondents was increased income opportunities**,** cited by 52.5% of trainees, indicating the economic appeal of vermicompost as a profitable agricultural practice. Organic farming awareness and adoption ranked second, with 20% of participants recognizing the environmental benefits and growing market demand for organic produce. Improved knowledge and skill development

Table 2. Reasons for Participation in Vermicompost Training Programmes

S.No.	Particular	Frequency	Percentage (%)
1	Improved Knowledge and Skill Development	19	15.3
2	Cost-Effective and Sustainable Farming Practices	13	10.1
3	Organic Farming Awareness and Adoption	25	20.0
4	Increased Income Opportunities	66	52.5
5	Support and Incentives from Government and Institutions	16	12.4

Table 3. Suggestions Given by the Trainees

S. No.	Suggestions	Frequency	Percentage (%)
1	More Practical Training Sessions	35	28.0
2	Provision of Training Materials and Tools	20	16.0
3	Government Support and Incentives	40	32.0
4	Awareness Campaigns on Benefits of Organic Farming	30	24.0
5	Regular Follow-Up and Monitoring	25	20.0

(15.3%) and support and incentives from government and institutions (12.4%) further highlighted the role of training in building capacity and leveraging external support. Lastly, cost-effective and sustainable farming practices (10.1%) reflected the interest in reducing input costs while promoting sustainability. These findings underscore the multifaceted benefits perceived by farmers and the critical role of training programmes in addressing economic, environmental and educational needs in agriculture.

The suggestions provided by the trainees highlight key areas for enhancing the effectiveness of the vermicompost training programmes. The most commonly suggested improvement was the provision of Government Support and Incentives (32.0%), emphasizing the need for financial assistance and motivational factors to encourage wider adoption of vermicompost practices. More Practical Training Sessions (28.0%) were also strongly recommended, indicating that hands-on experiences are crucial for improving the participants' skills and confidence in vermicompost. Awareness Campaigns on Benefits of Organic Farming (24.0%) were seen as essential for increasing the awareness and appeal of organic farming among farmers. Trainees also suggested the Provision of Training Materials and Tools (16.0%) to aid in better understanding and execution of the techniques taught. Lastly, Regular Follow-Up and Monitoring (20.0%) was suggested to ensure that the knowledge gained is effectively applied and sustained in the long term. These suggestions reflect a clear need for practical support, financial backing and continuous engagement to maximize the impact of the training program on farmers.

4. CONCLUSION

The vermicomposting training programmes conducted at Krishi Vigyan Kendra (KVK), Buxa, Jaunpur, have had a significant positive impact on the participants, particularly in enhancing their knowledge of sustainable farming practices and vermicompost techniques. The study revealed that the majority of trainees were middle-aged farmers, primarily from marginalized communities, with a keen interest in adopting cost-effective and sustainable farming practices. Increased income opportunities emerged as the primary motivation for participation, followed by a growing awareness of organic farming benefits. The training has equipped farmers with essential skills and knowledge, contributing to their ability to implement vermicompost in their agricultural practices. However, to further enhance the program's effectiveness, the study highlights several key areas for improvement. Trainees emphasized the need for more practical training sessions, better provision of training materials and tools and stronger government support and incentives to promote widespread adoption. Additionally, continuous follow-up and monitoring were recommended to ensure the sustained application of knowledge gained during the training.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image

generators have been used during writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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