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ASSESSMENT OF TRAINING NEEDS OF FARMERS ON INTEGRATED FARMING SYSTEMS

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ABSTRACT

The present study aimed to assess the training needs of farmers regarding Integrated Farming Systems (IFS) in the North Western Zone of Tamil Nadu. Utilizing an *ex-post facto* research design and a multistage sampling technique, the research involved the random selection of 16 villages from two chosen blocks across each of the four districts in the study area. A sample size of 160 respondents was achieved by selecting 10 farmers from each village. Data collection was facilitated through a well-structured interview schedule and a training need index specifically designed for this purpose. The findings indicate that the majority of respondents identified several key areas in which training is necessary: vermicomposting (51.25%), general aspects of IFS (48.75%), agriculture (43.75%), and animal husbandry (38.75%). Furthermore, the analysis revealed that a significant proportion of farmers (56.25%) exhibited a high level of training need, as evidenced by a mean score index of 73.07. In conclusion, the study highlights an urgent demand among farmers for information, skill acquisition, and knowledge enhancement related to IFS, with the aim of improving both productivity and profitability.

Keywords: Animal husbandry, North Western Zone, Tamil Nadu, Vermicomposting

Integrated Farming Systems (IFS) play a crucial role in enhancing rural livelihoods, particularly for farmers with small landholdings. IFS refers to the integration of two or more farming enterprises into a cohesive farming system. This approach has significant potential to serve as an effective tool for improving the rural economy due to its low investment requirements and high profitability (Nanda and Bandopadhyay, 2011; Nath *et al.*, 2020).

As India's population continues to rise, the demand for food is increasing, making food security a pressing concern. In this context, sustainable integrated farming presents a viable option for achieving optimal productivity while considering environmental sustainability. IFS maximizes production per unit area by recycling waste and residues, thus integrating livestock and agricultural sectors to enhance income and productivity. Consequently, IFS effectively addresses issues of sustainability, livelihood security, and income generation (Nath *et al.*, 2023). Furthermore, Bhuiyal *et al.* (2014) noted that IFS improves the efficiency of marginal and small farms, which often emerge as the most effective performers in integrating and arranging farming enterprises.

Despite its potential, the farming community often lacks the knowledge and skills necessary to maximize production and profit. Capacity-building programs serve as essential mechanisms for facilitating this knowledge transfer, as they promote continuous technical advancement, information accessibility, and empowerment (Rahman *et al.*, 2018; Inne Lego *et al.*, 2018). Training farmers is particularly vital in the realm of sustainable agriculture and livestock development. It is viewed as a significant and ongoing requirement for enhancing the skills of the farming community regarding the technologies associated with various farm enterprises (Bimal *et al.*, 2022).

Therefore, equipping farmers with a robust understanding of integrated farming systems is essential for improving their profitability and income generation. Providing targeted training is crucial to enhance their knowledge, skills, and practices related to IFS. In light of this, the present study was conducted in the North Western Zone of Tamil Nadu to assess the training needs of farmers regarding integrated farming systems.

MATERIALS AND METHODS

The study was conducted in the North Western Zone of Tamil Nadu, specifically in the districts of Salem, Namakkal, Dharmapuri, and Krishnagiri. Given the nature of the research problem, an *ex-post-facto* research design was employed to assess the training needs of farmers concerning Integrated Farming Systems (IFS). From each selected district, two blocks

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were randomly chosen, resulting in a total of eight blocks included in the study area. Subsequently, two villages were randomly selected from each block, culminating in a total of sixteen villages for the study. In each village, ten farmers who owned both land (up to 5 acres) and livestock were randomly selected, resulting in a sample size of 160 respondents for the study. To facilitate data collection, a well-structured interview schedule was developed and subjected to pre-testing in a non-study area to evaluate its clarity and effectiveness. Based on the results of this pre-testing, necessary modifications were made to enhance the interview schedule. The finalized pre-tested interview schedule served as the primary tool for data collection from the farmers, and the collected data was subsequently analyzed and interpreted.

Training need

Training need is defined as the extent of training required by respondents in various aspects of Integrated Farming Systems (IFS) to bridge the gap between their current technical knowledge and the desired level of expertise in farming practices.

Construction of items for training needs assessment

Different types of IFS models are prevalent in the study area but according to key informant technique, focus group interview and expert opinion, Agriculture + Animal Husbandry + Vermicomposting was identified as most popular, sustainable and dominant IFS model. Hence, a total of 41 items were selected on the areas of general aspects of IFS, animal husbandry practices, agriculture and vermicomposting by reviewing various literatures and put for 25 experts for obtaining opinion about the suitability of the items by using two point continuum i.e. suitable and not suitable. The items with the score of more than 75 was selected and included; thus a total of 23 items: General aspects of IFS (5 items), animal husbandry (8 items), agriculture (3 items) and vermicomposting (7 items) were selected for the training need assessment.

Extent of training need

Training Needs Assessment (TNA) is a fundamental step in delivering effective training to the farming community. It facilitates the identification of current knowledge, skills, and practices related to Integrated Farming Systems (IFS) through various methods, including surveys, interviews, observations, secondary data analysis, and workshops. The disparity between the existing status and the desired status highlights specific problems that can be translated into training needs. In this context, training needs refer to the gap between "what is" and "what should be" concerning the trainees' knowledge, skills, attitudes, and behaviours in a given situation and timeframe. By systematically assessing these needs, TNA ensures that training programs are tailored to address the specific challenges faced by farmers, thereby enhancing their effectiveness and relevance.

To deliver effective training for farmers, it is essential to understand the specific training needs of the farming community. Farmer training should be grounded in adult learning principles, as articulated by Knowles (1950), which emphasize the importance of conducting a thorough situational analysis and providing knowledge that is tailored to both needs and demands. Identifying points of dissatisfaction with the current state and recognizing the desire for change are crucial steps in this process. Each expressed need indicates the existence of a gap or discrepancy between the current situation ("what is") and the desired outcomes ("what could be" or "should be"). By addressing these gaps, training programs can be designed to meet the unique requirements of farmers, thereby fostering meaningful improvements in their practices and outcomes.

Building on this theoretical framework, the present study assessed the training needs of respondents using a four-point continuum: Most Needed, Needed, Least Needed, and Not Needed, with corresponding scores of 3, 2, 1, and 0 assigned to each category. The total scores achieved by respondents reflected their level of training needs across various aspects of Integrated Farming Systems (IFS), including general IFS knowledge, animal husbandry, agriculture, and vermicomposting. To quantify the extent of training needs, a Training Need Index was utilized. Based on this index, the training needs of respondents were categorized into three levels: low (0-33%), medium (34-66%), and high (67-100%). This categorization allowed for a nuanced understanding of the specific training requirements within the farming community.

$$\text{Training need index} = \frac{\text{Total obtained score}}{\text{Maximum obtainable score}} \times 100$$

RESULTS AND DISCUSSION

The results of the study are interpreted across several aspects, including the socio-economic profile of the farmers, variables related to their training needs, item-wise training needs for Integrated Farming Systems (IFS), and individual item analyses.

I. Socio economic profile of the farmers

Age

Table 1 indicates that the majority of farmers (47.5%) belong to the older age group, followed by 34.37% in the middle age group, and the remaining 18.2% are

classified as young. These findings contrast with those of Bhalerao *et al.* (2010), who reported that livestock-based farming systems in Konkan are primarily adopted by middle-aged farmers. Similarly, Morya (2015) noted that a significant proportion (66%) of integrated farmers in Mandla district, Madhya Pradesh, were also middle-aged. This suggests that many farmers are engaged in traditional farming practices, which may explain the higher representation of older respondents in this study.

Education

The findings of the study reveal that 30% of respondents were illiterate, while 7.5% could read, and 16.8% were able to read and write. Nearly the same proportion, 13.7%, had completed primary school, and 15% had achieved a high school education. Additionally, 8.12% and 5% of respondents had attended secondary and higher secondary levels, respectively. Only a small fraction, 3.75%, of respondents were graduates in the study area. These results align with the findings of Bhalerao *et al.* (2010), who reported that Integrated Farming System (IFS) farmers generally possess a high school level of education. Similarly, Prasad *et al.* (2011) noted that integrated farmers from Sahibganj and Pakur districts in Jharkhand had low levels of education. In contrast, Mahadik *et al.* (2010) observed that the majority of integrated farmers (36.8%) were educated up to the secondary level.

Gender

It is evident from table 1 that the majority of respondents, specifically more than three-quarters (88.75%), were male, while only 11.25% were female. These findings suggest that farming activities have traditionally been dominated by males.

Occupation

As evident from the table 1, all respondents practiced agriculture as their main occupation, as farmers engaged in agriculture were specifically selected for this study. Most of the farmers (88.75%) also engaged in livestock farming as a secondary occupation, while 7.5% practiced vermicomposting. A very small percentage, each 0.62%, were involved in horticulture and agroforestry, and only 1.8% worked as agricultural labourers. Given that the study focuses on Integrated Farming Systems (IFS), respondents were chosen based on their possession of land and livestock, which explains the prevalence of livestock farming as a secondary occupation. In IFS, the livestock component can be easily integrated with agricultural practices, likely contributing to the higher number of respondents using livestock as a secondary source of income. These observations align with findings by Sasikala *et al.* (2024), which highlight that milch animals (cows and buffaloes), regardless of breed and productivity, are the

Table 1. Socio economic profile of the farmers (n=160)

Sr. No.	Variables	Frequency	Percentage
1.	Age		
a	Young (Up to 33 years)	29	18.12
b	Middle (34-43 years)	55	34.37
c	Old (> 43 years)	76	47.5
		Mean ± SD: 43.36 ±10.79	
2.	Education		
a	Illiterate	48	30
b	Can read only	12	7.5
c	Can read and write	27	16.8
d	Primary	22	13.7
e	High school	24	15
f	Secondary	13	8.12
g	Higher secondary	8	5
h	Graduate and above	6	3.75
3.	Gender		
a	Male	142	88.75
b	Female	18	11.25
4.	Occupation		
i)	**Primary occupation** Agriculture	160	100
ii)	Secondary occupation		
a	Livestock farming	142	88.75
b	Vermicomposting	12	7.5
c	Horticulture	1	0.62
d	Agricultural laborer	3	1.8
5.	Farming experience		
	Low (up to 11 years)	24	15
	Medium (11-25 years)	115	71.87
	High (>25 years)	21	13.12
		Mean ± SD: 18.08 ± 7.14	
6.	Operational land holding		
	Marginal	98	61.25
	Small	62	38.75
7.	Livestock possession		
	Cattle	32	20
	Buffalo	7	4.37
	Goat	24	15
	Sheep	2	1.25
	Poultry	9	5.62
	Mixed	86	53.75
8.	Annual income		
	Low	17	10.62
	Medium	84	52.51
	High	59	36.87

primary choice for farmers as an integral part of their farming systems.

Farming experience

Table 1 illustrates the farming experience levels of the respondents. Nearly three-quarters (71.87%) of the respondents had a medium level of farming experience, while 15% had a low level and 13.12% had a high level of experience. The predominance of farmers with medium-level experience may be attributed to the traditional nature of their farming practices. These findings are consistent with those of Bhalerao *et al.* (2010), who reported that respondents in their study also exhibited a medium level of farming experience.

Operational land holding

It is evident from table 1 that the majority of respondents (61.25%) were marginal farmers, followed by small farmers (38.75%). This distribution reflects the nature of the study, as Integrated Farming Systems (IFS) are particularly suited to small and marginal farmers. Supporting these findings, Nageswaran *et al.* (2009) reported that the majority of IFS-adopting farmers (47.3%) were marginal farmers (with land holdings below 2.5 acres), while 29.4% were small farmers (with land holdings between 2.5 and 5.0 acres). Similarly, Prasad *et al.* (2011) found that most integrated farmers in the Sahibganj and Pakur districts of Jharkhand belonged to small and marginal categories. According to Thamizoli *et al.* (2006) and Meshram *et al.* (2020), IFS is regarded as a powerful tool for enhancing the profitability of farming systems for small and marginal farmers.

Livestock possession

It is clear from table 1 that 20% of the farmers owned cattle exclusively, while 4.37% had buffaloes. Additionally, 15% owned goats, 1.25% had sheep, and 5.62% raised poultry. Notably, the majority (53.75%) of respondents had a combination of these animals. These results highlight the integration of livestock with agricultural practices. The prevalence of dairy farming among respondents may be attributed to the higher income potential it offers. Moreover, goats significantly contribute to farmers' income due to the strong demand for goat meat (chevon). These findings are consistent with those of Prabu *et al.* (2011), who noted that goat farming is a profitable income-generating avenue in Tamil Nadu.

Annual income

The observations indicate that the majority of respondents (52.5%) belong to the medium-income group, followed by the high-income group (36.87%), while 10.62% fall into the low-income category. The prevalence of medium and low income levels may be attributed to insufficient knowledge about farming system models and a lower rate of adoption of improved technologies. These findings are consistent with those of Mahadik *et al.* (2010), who reported that the majority of farmers engaged in rice and backyard poultry farming earned a medium level of income.

II. Distribution of respondents according to the variables related to training needs of the farmers

More than three-quarters (80%) of the respondents had not undergone any training related to Integrated Farming Systems (IFS), indicating a lack of awareness about these systems. Furthermore, the majority (83.75%) expressed a preference for training to be conducted at their own location, without disrupting their daily routines, highlighting their caution regarding monetary benefits. Over half of the respondents (61.25%) favoured the use of multimedia compact discs for training, followed by 23.12% who preferred audio-visual aids. This preference highlights the need for interactive and engaging teaching methods. Additionally, 60% of the farmers indicated a desire for one-day training sessions, while 33.12% preferred training programs lasting only 2 to 3 days (Table 2). These results align with the observations of Nongtdu *et al.* (2012) and clearly indicate that farmers require training on integrated farming systems delivered through various engaging formats to improve productivity and enhance income through effective farming practices.

III. Training need of respondents on various items of integrated farming system

Various items for assessing training needs were identified based on expert opinion. The training needs perceived by farmers were categorized into four main areas related to Integrated Farming Systems (IFS).

Among these areas, the majority of farmers indicated that training was most needed in all domains: 51.25% for vermicomposting, 48.75% for general aspects of IFS, 43.75% for agriculture, and 38.75% for animal husbandry (Table 3). In contrast, only a small percentage of farmers felt that training was least needed or not needed in any of these areas. Training needs were further ranked based on the scores, reflecting farmers' perceptions of IFS and their awareness of these practices, which may motivate them to seek training for enhancing their socio-economic status. Additionally, agriculture-oriented programs available on social media, YouTube channels, television, and radio may have played a role in encouraging farmers to pursue training in IFS. Farmers are likely driven by the need for year-round income and employment to meet their family needs, which could explain their eagerness

Table 2. Variables related to training needs of farmers (n=160)

Sr. No.	Variable	Frequency (f)	Percentage (%)
1.	Previous training exposure on IFS		
	Yes	32	20
	No	128	80
2.	Preferred place of training		
	Own place	134	83.75
	Other training institutions	26	16.25
3.	Desired training methods		
	Audio visual	37	23.12
	Multimedia compact disc	98	61.25
	Field tour	23	14.37
	Group discussion	2	1.25
4.	Duration of training		
	1 day	96	60
	2-3 days	53	33.12
	1 week	7	4.37
	2 weeks	4	2.5

to obtain training. These findings are consistent with Biswas (2010), who noted that effective farming systems revolve around optimizing time, money, resources, and family labour, enabling farm families to achieve gainful employment throughout the year, thereby ensuring good income and an improved standard of living, even from small holdings. Similarly, Pandey *et al.* (2015) emphasized the necessity of orientation and training to update knowledge on the latest farming technologies. Poorani *et al.* (2011) also found that many farmers in Palladam *taluk*, Tamil Nadu, lacked knowledge about resource allocation among the existing components of IFS, further highlighting their training needs.

Among the identified training needs, the requirement for training on Integrated Farming Systems (IFS) was ranked highest, with a mean score of 2.31, followed closely by vermicomposting, which received a mean score of 2.24. Training needs related to agriculture ranked third (mean score: 2.13), while animal husbandry ranked fourth (mean score: 2.07). Farmers expressed a strong desire for training in IFS, likely driven by their eagerness to increase income and improve their standard of living. The results indicate that the majority of respondents, across various categories, are interested in training on IFS. This finding highlights the significance of IFS in enhancing the economic status of farmers, particularly marginal and smallholders. While respondents in the study area may be aware of IFS, they often lack in-depth knowledge about its implementation. This gap in understanding likely motivates them to seek training in IFS. Marginal and small farmers typically engage in IFS practices; however, they may not fully

Table 3. Item wise training needs of the farmers (n=160)

Areas (General aspects of IFS)	Most Needed (3)	Needed (2)	Least Needed (1)	Not Needed (0)	Mean Score	Rank
IFS	78 (48.75)	62 (38.75)	12 (7.5)	8 (5.0)	2.31	I
Animal Husbandry	62 (38.75)	60 (37.5)	26 (16.25)	12 (7.5)	2.07	IV
Agriculture	70 (43.75)	54 (33.75)	24 (15)	12 (7.5)	2.13	III
Vermicomposting	82 (51.25)	44 (27.5)	25 (15.62)	9 (5.62)	2.24	II

*χ^2: 14.05^{NS} *p value is not significant at p < 0.1*

Figures in the parentheses indicate the percentage to the corresponding frequency

Table 4. Training needs perceived by the farmers in items of general aspects of Integrated Farming System (IFS)

Items of IFS	Most Needed (3)	Needed (2)	Least Needed (1)	Not Needed (0)	Score
Introduction of IFS in agriculture	43 (26.87)	78 (48.75)	26 (16.25)	13 (8.12)	311
Suitable land size for IFS	52 (32.50)	58 (36.25)	36 (22.5)	14 (8.75)	308
Components of IFS	78 (48.75)	46 (28.75)	25 (15.62)	11 (6.87)	351
Economics of the IFS models	90 (56.25)	47 (29.37)	20 (12.5)	3 (1.87)	384
Advantages of IFS	66 (41.25)	78 (48.75)	15 (9.37)	1 (0.62)	369

Figures in the parentheses indicates the percentage to the corresponding frequency

optimize resource utilization to maximize their income levels, which further highlights their training needs. Additionally, since these farmers traditionally practice agriculture alongside animal husbandry, they likely possess some knowledge in these areas, which may explain the lower rankings for agriculture and animal husbandry training needs.

IV. Training need of respondents depends on individual items of IFS

a. Training needs perceived by the farmers in the items of general aspects of IFS

Table 4 shows that 26.87% of farmers considered the introduction of Integrated Farming Systems (IFS) as a most needed training item, while 48.75% viewed it as needed. Approximately one-third of respondents expressed a desire for training on suitable land size for IFS, with 32.5% categorizing it as most needed and 36.25% as needed. Similarly, 48.75% of farmers identified components of IFS as most needed, while 28.75% recognized them as needed training items. Moreover, a significant majority—56.25% and 29.37%—regarded the economics of IFS as most needed and needed items for training, respectively. Nearly half of the respondents (41.25% and 48.75%) acknowledged the importance of training on the advantages of IFS, classifying it as most needed and needed, respectively. Only a small percentage felt that these topics were least needed or not needed for training. These results highlight the farmers' need for a thorough understanding of IFS before fully implementing the technique. Farmers expressed a desire to learn about new procedures, practical possibilities, profitability, and the advantages of IFS prior to trialing these methods. Furthermore, they indicated that they would only practice the technique if they found the training satisfactory. These findings are consistent with the observations of Sasikala *et al.* (2024).

b. Training needs perceived by the farmers in the items of animal husbandry practices

Table 5 reveals that 56.25% of respondents identified marketing opportunities as the most needed area for training, followed closely by 53.12% who felt that breeding and feeding management of animals was also a critical training need. Additionally, 48.75% of respondents highlighted the management of young, pregnant, and lactating animals as a key training component under IFS. These findings indicate that farmers are eager to receive training and acquire information on profit-oriented areas to enhance their

Table 5. Training needs perceived by the farmers (n =160) in items of animal husbandry practices

Items of animal husbandry practices	Most Needed (3)	Needed (2)	Least Needed (1)	Not Needed (0)	Score
Selection of animals	70 (43.75)	36 (22.5)	12 (7.5)	6 (3.75)	294
Housing of animals	66 (41.25)	36 (22.5)	20 (12.5)	8 (5.0)	290
Feeding of animals	82 (51.25)	38 (23.75)	16 (10.0)	7 (4.37)	338
Breeding management	85 (53.12)	42 (26.25)	26 (16.25)	8 (5.0)	365
Management of young ones	78 (48.75)	30 (19.0)	20 (12.5)	9 (5.62)	314
Management of pregnant and lactating animals	78 (48.75)	52 (32.5)	24 (15.0)	12 (7.5)	362
Common diseases	70 (43.75)	33 (21.0)	20 (12.5)	5 (3.12)	296
Deworming and vaccination	66 (43.75)	30 (19.0)	20 (12.5)	6 (3.75)	278
Marketing opportunities	90 (56.25)	54 (33.75)	15 (9.37)	5 (3.12)	393

Figures in the parentheses indicate the percentage to the corresponding frequency

Table 6. Training needs perceived by the farmers (n=160) in items of agriculture

Items of agriculture	Most Needed (3)	Needed (2)	Least Needed (1)	Not Needed (0)	Score
Seeding /seedling rate	85 (53.12)	52 (32.5)	20 (12.5)	3 (1.87)	379
Establishment	75 (46.87)	66 (41.25)	16 (10)	3 (1.87)	373
Yield	110 (68.75)	47 (29.37)	3 (1.87)	0	427

Figures in the parentheses indicate the percentage to the corresponding frequency

Table 7. Training needs perceived by the farmers (n=160) in items of vermicomposting

Items of Vermicomposting	Most Needed (3)	Needed (2)	Least Needed (1)	Not Needed (0)	Score
Selection of site	95 (59.37)	36 (22.5)	20 (12.5)	9 (5.62)	377
Construction of Vermicompost pit	85 (53.12)	48 (30.0)	20 (12.5)	7 (4.37)	371
Raw materials	70 (43.75)	52 (32.5)	30 (18.75)	8 (5.0)	344
Cost of breeding worms	88 (55.0)	42 (26.25)	18 (11.25)	12 (7.5)	366
Procedure of making	100 (62.5)	38 (23.75)	16 (10.0)	6 (3.75)	392
Harvesting	57 (35.62)	45 (28.12)	30 (18.75)	28 (17.5)	291
Storage	68 (42.50)	54 (33.75)	33 (20.62)	5 (3.12)	345

Figures in the parentheses indicate the percentage to the corresponding frequency

income beyond their current farming conditions.

c. Training needs perceived by the farmers in the items of agriculture

Table 6 indicates that more than half of the respondents considered seeding or seedling rates as the most needed training item, with 32.5% categorizing it as needed. Following this, 46.87% and 41.25% of farmers identified training on the establishment of the farming system as most needed and needed, respectively. Furthermore, a significant majority (68.75%) viewed training on yield as most needed, while 29.37% classified it as needed. These findings suggest that farmers are keen to gain more information on economically oriented areas. Before adopting new crops or plants, they seek clarity on the required expenditures and input levels necessary to achieve satisfactory income levels. Additionally, farmers are interested in understanding the potential for increased income compared to their current farming practices. This desire for knowledge likely drives their need for training.

d. Training needs perceived by the farmers in sub-areas of vermicomposting

Table 7 indicates that the majority of farmers (62.5%) identified the procedure for making vermicompost as the most needed training item. Additionally, 59.37% regarded site selection for vermicomposting as essential, followed by more than half of the respondents (55%) who emphasized the importance of understanding the costs associated with breeding worms. The table also shows that the construction of vermicomposting pits was identified as a training requirement by 53.12% of the farmers, while 43.75% expressed the need for information on the raw materials required. Furthermore, nearly half of the respondents (42.5%) felt that training on the storage of finished vermicompost was crucial, and 35.62% highlighted harvesting as a key area for training. These findings highlight the significance of vermicomposting as a viable income-generating enterprise. The appeal of vermicomposting lies in its low capital investment and the potential for substantial returns, as it allows farmers to biofertilize their land through the application of vermicompost. Consequently, there is a strong interest among farmers in obtaining training in this area.

Extent of training need

The extent of training needs was assessed using the Training Need Index, calculated by dividing the obtained score by the maximum obtainable score. As indicated in Table 8, a majority of farmers (56.25%) demonstrated a high level of training need for Integrated Farming Systems (IFS), followed by

Table 8. Extent of training needs perceived by the farmers (n=160)

Sr. No.	Extent of training need	Frequency (n)
1.	Low (0-33%)	5 (3.12)
2.	Medium (34-66 %)	66 (41.25)
3.	High (67-100%)	90 (56.25)

Figures in the parentheses indicate the percentage
*χ^2: 50.14**, p-value is < 0.00001 and is significant at p < 0.01*

41.25% who reported a medium level of need, while only a small fraction (3.12%) indicated a low level of training need. The mean score index for the farmers was notably high at 73.07, accompanied by a significant chi-square value of 50.14** at the 1% level, highlighting their strong desire for training in various aspects of IFS. This urgency can be attributed to several factors: farmers may not be achieving sufficient income and employment through their current farming practices, the cost of applying traditional fertilizers may exceed that of using vermicompost, and there is a pressing need to optimize resource utilization for higher income. Furthermore, mass media channels have likely played a role in stimulating awareness and interest in these practices among farmers. These findings align with those of Sasikala (2023), who emphasized the necessity of organizing training sessions to update the farming community on the latest agricultural technologies.

CONCLUSION

The findings of this study highlight the significant role of Integrated Farming Systems (IFS) in enhancing the livelihoods of marginal and small farmers. By effectively recycling by-products from one enterprise to serve as inputs for another, IFS promotes resource efficiency and profitability while contributing to sustainable development. Moreover, IFS offers not only economic and nutritional security but also ensures year-round income and employment opportunities for farming communities. However, a major barrier to the successful adoption of IFS is the lack of knowledge and information among farmers about its components and benefits. Without proper understanding of how to utilize available resources effectively, farmers risk capital loss and may struggle to sustain their enterprises.

To address these challenges, it is essential for extension agents to prioritize comprehensive training programs aimed at educating farmers about the principles and practices of IFS. Regular workshops and hands-on training sessions can bridge the existing knowledge gap and empower farmers to implement IFS more effectively. Additionally, agricultural institutions and extension agencies should organize ongoing training initiatives to keep farmers updated on the latest techniques and innovations in IFS. This continuous learning approach will enable farmers to make informed decisions and improve their operational efficiency.

Furthermore, policymakers and stakeholders must develop supportive policies that provide farmers with access to credit facilities, subsidies, and essential inputs. Such measures will motivate farmers to adopt IFS as a viable strategy for sustainable livelihoods. Leveraging mass media platforms to disseminate information about IFS can also significantly raise awareness and interest among farmers. Educational campaigns through social media, television, and radio can enhance understanding of IFS practices.

Looking ahead, future research should focus on the long-term impacts of IFS on the economic and social well-being of farming communities. Detailed case studies of successful IFS implementations can provide valuable insights and best practices for replication in other regions. Additionally, assessing the socio-economic impacts of IFS on income, employment, and food security will help quantify its benefits and guide policy formulations. Understanding the specific barriers that hinder farmers from adopting IFS will enable the development of targeted interventions to address these challenges effectively. Finally, exploring the role of technological innovations in enhancing the efficiency and effectiveness of IFS can lead to improved practices and outcomes for farmers. By addressing these areas, future research can contribute to a deeper understanding of IFS and support its broader adoption, ultimately fostering sustainable agricultural practices and improving the livelihoods of farmers.

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