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Personal, Socio-economic and Psychological Profile of Integrated Farming System Module Practicing Farmers in North-Eastern Dry Zone (Zone-II) of Karnataka, 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 Green Revolution's intensive practices led to soil degradation and land fragmentation continues, reducing farm efficiency. As the population grows, agricultural sustainability faces pressure with declining land and productivity. Small farmers, who make up to 85.00 per cent of the population, struggle with low incomes. Integrated Farming Systems (IFS) are being explored to boost farmers income and promote sustainability through diversified practices. A study conducted in the North-eastern dry zone of Karnataka analysed the profile of Integrated Farming System (IFS) practicing farmers. Among 240 respondents, 53.33 per cent were in the middle age category, followed by 23.33 per cent with pre-university education. The majority (54.17 %) had medium family size and 52.92 per cent had 15-30 years of farming experience. Regarding farm size, 55.83 per cent were medium farmers and 54.58 per cent had medium cropping intensity. Additionally, 54.58 per cent had medium irrigation potential, while 50.83 per cent showed medium innovative proneness. A majority (60.42 %) had medium risk orientation, and 55.83 per cent displayed medium achievement motivation. In terms of management orientation, 47.08 per cent had medium levels, while 51.67 per cent had medium scientific orientation. Furthermore, 52.50 per cent had high decision-making ability, 47.50 per cent had medium mass media exposure, and 52.92 per cent had medium extension participation. Lastly, 42.50 per cent had high economic motivation. These results emphasize the prominence of medium levels across several variables, which are crucial for designing appropriate interventions for IFS adoption.

Keywords: Sustainability; decision making; cropping intensity; irrigation potential.

1. INTRODUCTION

India’s agricultural growth since independence has been a testament to the resilience and perseverance of its farmers, who have met the nation’s increasing food demand. Despite the impressive record of 329.68 million tonnes in food grain production (Anon., 2023), farmers face economic vulnerability due to resource degradation, climate change and low profitability. While boosting yields, the Green Revolution led to the over-exploitation of natural resources, contributing to soil degradation and fragmentation of land holdings, reducing overall farm efficiency (Singh and Burark, 2016).

The growing population, expected to reach 1.37 billion by 2030, further pressures India’s agricultural landscape, with arable land declining and agricultural productivity facing challenges. Projections suggest that more than 20.00 per cent of the current cultivable area could be used for non-agricultural purposes by 2030 (Kumara et al., 2019). Small land holdings, which averaged 2.28 hectares in 1970-71, have shrunk to 1.16 hectares by 2010-11, and they are expected to continue declining, posing a significant challenge to food production and sustainability (Vinay et al*.,* 2017).

To address these issues, Integrated Farming Systems (IFS) offer a promising solution by diversifying farming activities and improving resource utilization. With 44.00 per cent of India's net sown area under rainfed conditions, IFS provides small and marginal farmers with opportunities to enhance income through diverse practices such as dairy, poultry, aquaculture, and sericulture (Nataraju et al*.,* 2018). This study aims to explore the personal, socio-economic, and psychological profiles of IFS-practicing farmers to assess the potential of IFS in enhancing agricultural sustainability and supporting farmer livelihoods.

2. METHODOLOGY

Research design is the most crucial aspect of research methodology. In the present study, Ex-post facto research design was used. A sample of 240 Integrated Farming System (IFS) practicing farmers was determined, the sampling process involved a multistage random sampling procedure to ensure a representative and

accurate sample. The North-Eastern Dry Zone of Karnataka comprises three districts viz., Kalaburagi, Raichur and Yadgir. Three taluks from each of these districts namely Kalaburagi, Manvi and Shorapur were selected for the study. Selection was based on having the highest number of beneficiary farmers over the past three years, as determined in consultation with the Department of Agriculture, Government of Karnataka. A list of villages where many IFS practicing farmers prepared in consultation with officials of the Development Departments (Agriculture, Horticulture and Animal Husbandry) and NGO's. Further, 10 villages were drawn as IFS study villages based on the maximum number of IFS practicing farmers under each selected taluk i.e., 30 villages. For the study, a sample size of 80 IFS practicing farmers from each selected taluk was chosen as a respondent i.e., from each village, eight IFS practicing farmers were chosen randomly. Thus, a sample size of 240 IFS practicing farmers from three study taluks was constituted. The data was collected during the year 2023-24. Primary data was collected through a personal interview technique with the help of a pre-tested, well structured interview schedule.

3. RESULTS AND DISCUSSION

The Integrated Farming System module practicing farmers were distributed into different categories based on their personal, socio-economic and psychological profile and the results were represented in the following Tables.

Data in Table 1 enunciated that among 240 farmer respondents practicing the Integrated Farming Systems in the study area, more than fifty per cent (53.33%) of the respondents belonged to middle age category followed by 25.00 per cent of the farmers belonged to young age and 21.67 per cent of the farmers belonged to old age group.

In Kalaburagi district, more than half (55.00%) of the respondents belonged middle age group followed by 26.25 per cent to young age group and more than one-sixth (18.75 %) of farmers belonged to old age group. With respect to Raichur district, less than three-sixth (48.75 %) of farmers belonged to middle age group followed by 27.50 per cent of farmers were belonged to old age and 23.75 per cent of the farmers belonged to young age group. In case of Yadgir district young, middle and old age respondents were to extent of 25.00, 56.25 and 18.75 per cents respectively.

Age plays a key role in decision-making for basic needs, with middle-aged farmers being more involved and efficient in farming. Younger farmers show less interest in Integrated Farming Systems (IFS), likely due to job insecurity and limited awareness of agriculture's potential. These findings align with studies by Meshram et al*.* (2020), Chandana et al*.* (2021), Mishra et al*.* (2023), and Vani (2023).

It is observed from the Table 2 that, one-fifth (23.33%) of farmers were with pre-university education followed by 22.08 per cent with high school. However, 19.17, 17.50, 7.08 and 6.25 per cent farmers having primary school, middle school, illiterate and graduation respectively. Similarly, 4.58 per cent can read and write.

It is evident from the results that the education level of the respondents comprised illiterate in Kalaburagi (03.75%), Raichur (06.25%) and Yadgir (11.25%). On the other hand, primary level of education was possessed by farmers of Kalaburagi (16.25 %), Raichur (18.75%) and Yadgir (22.50%). High school level of education was found in Kalaburagi (20.00%), Raichur (18.75%) and Yadgir (27.50%). Whereas, pre-university level of education in Kalaburagi (32.50 %), Raichur (26.25%) and Yadgir (11.25%). Followed by graduation level of education Kalaburagi (10.00%), Raichur (05.00%) and Yadgir (03.75%) districts.

Education is crucial for farmers' income and employment security, with many having primary to pre-university education due to rural

Table 1. Distribution of IFS practicing farmers according to their age

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Young (<35 years)	21	26.25	19	23.75	20	25.00	60	25.00
2	Middle (36-50 years)	44	55.00	39	48.75	45	56.25	128	53.33
3	Old (>50 years)	15	18.75	22	27.50	15	18.75	52	21.67
	Total	80	100.00	80	100.00	80	100.00	240	100.00

Table 2. Distribution of IFS practicing farmers according to their education

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Illiterate (Can't read and write)	03	03.75	05	06.25	09	11.25	17	07.08
2	Can read and write (Functionally literate)	02	02.50	03	03.75	06	07.50	11	04.58
3	Primary school (1^{st} – 4^{th} standard)	13	16.25	15	18.75	18	22.50	46	19.17
4	Middle school (5th -7th standard)	12	15.00	17	21.25	13	16.25	42	17.50
5	High school (8th -10th standard)	16	20.00	15	18.75	22	27.50	53	22.08
6	Pre-University Course (11th to 12th Standard)	26	32.50	21	26.25	09	11.25	56	23.33
7	Graduation and above (Above 12th standard)	08	10.00	04	05.00	03	03.75	15	06.25
	Total	80	100.00	80	100.00	80	100.00	240	100.00

Table 3. Distribution of IFS practicing farmers according to their family size

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Small (1-4 members)	19	23.75	14	17.50	26	32.50	59	24.58
2	Medium (5-6 members)	44	55.00	47	58.75	39	48.75	130	54.17
3	Large (>7 members)	17	21.25	19	23.75	15	18.75	51	21.25
	Total	80	100.00	80	100.00	80	100.00	240	100.00

educational initiatives. Educated farmers showed interest in integrating more enterprises. These findings align with Sheikh et al*.* (2021), Arghyadeep (2022), Gayathri (2023), and Madhuprasad et al*.* (2024).

It is accounted that more than three-sixth (54.17%) of the farmers were belonged to medium family size category followed by more than one-fifth (24.58%) with small and 21.25 per cent of farmers belonged to large family size category in the study area.

It was observed from the Table 3 that, in case of Kalaburagi district, more than half of the farmers (55.00 %) were belonged to medium family size followed by small (23.75%) and large (21.25%). While, in case of Raichur district, more than three-sixth (58.75%) of the farmers belonged to medium family size followed by large (23.75 %) and small (17.50 %), as where in Yadgir district less than three-sixth (48.75 %) of farmers were belonged to medium family size followed small (32.50 %) and large (18.75 %).

Family size impacts farm activities, with medium-sized families showing higher involvement in crop enterprises. Awareness of small family norms and land fragmentation has led some farmers toward nuclear families. These findings align with Meshram et al*.* (2020), Chandana et al*.* (2021), Ramya (2021), and Gayathri (2023).

Table 4. Distribution of IFS practicing farmers according to their farming experience

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Less (Up to 14 years)	27	33.75	24	30.00	22	27.50	73	30.42
2	Moderate (15-30 years)	43	53.75	39	48.75	45	56.25	127	52.92
3	More (>30 years)	10	12.50	17	21.25	13	16.25	40	16.67
	Total	80	100.00	80	100.00	80	100.00	240	100.00

With respect to farming experience of IFS practicing farmers, it is evident from Table 4 that more than three-sixth (52.92%) of the farmers belonged to 15-30 years of farming experience, 30.42 per cent of farmers belonged to up to 14 years of farming experience and 16.67 per cent of them belonged to more than 30 years of farming experience.

On an average across the study area, more than three-sixth (53.75%) of the farmers belonged to 15-30 years of farming experience in Kalaburagi district followed by 33.75 per cent of them belonged to up to 14 years of farming experience and 12.50 per cent of them belonged to more than 30 years of farming experience. While, in case of Raichur district, less than half (48.75%) of the farmers belonged to 15-30 years of farming experience followed by up to 14 years (30.00%) and more than 30 years (21.25%), as where in Yadgir district, more than three-sixth (56.25%) of them were belonged to 15-30 years of farming experience followed by up to 14 years (27.50%) and more than 30 years (16.67 %) of farming experience.

Farming experience is key to decision-making, helping farmers choose suitable crops or enterprises. Medium farming experience allows for rational decisions, while those with higher experience have better knowledge of integrated farming practices and can predict risks, leading to higher returns. These findings align with Ramya (2021) and Vani (2023).

With respect to annual income of IFS practicing farmers, it is evident from Table 5 which indicated that, nearly two-fifth (39.59 %) of the farmers are belonged to high level of income groups followed by medium (39.16 %) and low (21.25 %) level, respectively.

Regarding the findings from different districts within the North-Eastern dry zone, more than half (52.50 %) of farmers belonged to high level of annual income in Kalaburagi district followed by slightly less than one-third (31.25 %) and 16.25 per cent of them belonged to medium and low level of annual income, respectively. While, in case of Raichur district, more than two-fifth (45.00 %) of farmers belonged to high level of annual income followed by medium (36.25 %) and low (18.75 %). Whereas in Yadgir district, exactly half (50.00 %) of farmers were classified under medium level of annual income, followed by low (28.75 %) and high (21.25 %) level of annual income, respectively.

IFS farmers benefit from diversified enterprises that supplement each other, reduce input costs, and provide year-round income, leading to higher or medium income levels. This aligns with the findings of Gayathri (2023).

Table 5. Distribution of IFS practicing farmers according to their annual income

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Low (< ₹ 98,756	13	16.25	15	18.75	23	28.75	51	21.25
2	Medium (₹ 98,756 – ₹ 1,61,168)	25	31.25	29	36.25	40	50.00	94	39.16
3	High (> ₹ 1,61,168)	42	52.50	36	45.00	17	21.25	95	39.59
	Total	80	100.00	80	100.00	80	100.00	240	100.00

Table 6. Distribution of IFS practicing farmers according to their land holding

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Marginal farmers (Up to 2.5 acres)	09	11.25	05	06.25	07	08.75	21	08.75
2	Small farmers (2.51 to 5.00 acres)	20	25.00	28	35.00	23	28.75	71	29.58
3	Medium farmers (5.01 to 25 acres)	46	57.50	41	51.25	47	58.75	134	55.83
4	large farmers (More than 25.01 acres)	05	06.25	06	07.50	03	03.75	14	05.83
	Total	80	100.00	80	100.00	80	100.00	240	100.00

The respondents were classified according to the total area of land owned and cultivated by the individual respondents. From the Table 6, it could be seen that more than three-sixth (55.83%) of the respondents were medium category farmers followed by a significant per cent of small farmers (29.58%) and more than one-twelfth (08.75 %) and 05.83 per cent of farmers were marginal and big farmers respectively.

With respect to Kalaburagi district, less than three-fifth (57.50%) of farmers were belonged to medium level of land holding followed by exactly one fourth (25.00%), less than one-ninth (11.25%) and 06.25 per cent of farmers were belonged to small, marginal and big farmers, respectively. While in case of Raichur district, slightly more than three-sixth (51.25%) of farmers were belonged to medium level of land holding followed by more than one-third (35.00%), less than one-fourteenth (07.50%) and 06.25 per cent of farmers were belonged to small, big and marginal farmers category, respectively. Whereas in Yadgir district, less than three-fifth (58.75%) of farmers were belonged to medium level of land holding followed by more than one-fourth (28.75%), less than one-twelfth (08.75%) and 03.75 per cent of farmers were belonged to small, marginal and big farmers category, respectively.

Around 80.00 per cent of land holdings are small and medium-sized, as agriculture remains the main occupation and livelihood for most families. These findings align with Sheikh et al. (2021), Gayathri (2023), Mishra et al. (2023), and Madhuprasad et al. (2024).

A bird eye view of the Table 7 depicted that more than three-sixth (54.58%) of the farmers had medium level of cropping intensity followed by less than one-fourth (24.58%) of farmers had high and 20.83 per cent of the farmers had belonged to low level of cropping intensity.

With respect to Kalaburagi district, it was found that less than three-fifth (57.50%) of the respondents belonged to medium level of cropping intensity followed by high level (23.75%) and low level (18.75 %) of cropping intensity. While in case of Raichur district, more than three-sixth (55.00 %) of farmers were belonged to medium level of cropping intensity followed by less than one-fourth (23.75 %) of farmers and 21.25 per cent of farmers were belonged to low and high cropping intensity, respectively. Whereas in Yadgir district, more than half (51.25 %) of farmers were belonged to medium level of cropping intensity followed by less than one-third (31.25 %) and 17.50 per cent of farmers were belonged to low and high cropping intensity, respectively.

Cropping intensity reflects productivity per unit of land, with most respondents having small to medium land holdings and medium productivity, resulting in medium cropping intensity. These findings align with Shwetha (2019) and Meshram (2020).

It is perceptible from Table 8 that, more than three-sixth (54.58%) of the farmers had medium level of irrigation potential, whereas more than one-fourth (26.25%) and 19.17 per cent of the respondents had high and low level of irrigation potential, respectively.

Concerning the outcomes observed across various districts in the North Eastern Dry Zone, less than three-sixth (45.00%) of the farmers belonged to high level of irrigation potential in Kalaburagi district followed by more than two-fifth (43.75%) of them belonged to medium and 11.25 per cent of them belonged to low level of

Table 7. Distribution of IFS practicing farmers according to their cropping intensity

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Lower cropping intensity (100 % - 117 %)	15	18.75	19	23.75	25	31.25	59	24.58
2	Medium cropping intensity (117 % - 128 %)	46	57.50	44	55.00	41	51.25	131	54.58
3	High cropping intensity (128 % - 146 %)	19	23.75	17	21.25	14	17.50	50	20.83
	Total	80	100.00	80	100.00	80	100.00	240	100.00
Mean cropping intensity =123 % SD = 10%									

Table 8. Distribution of IFS practicing farmers according to their irrigation potential

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Low (<11.61 score)	09	11.25	15	18.75	22	27.50	46	19.17
2	Medium (11.61-13.62 score)	35	43.75	47	58.75	49	61.25	131	54.58
3	High (>13.62 score)	36	45.00	18	22.50	09	11.25	63	26.25
	Total	80	100.00	80	100.00	80	100.00	240	100.00
		Mean=12.62		SD=2.01					

irrigation potential. While, in case of Raichur district, less than three-fifth (58.75%) of farmers belonged to medium level of irrigation potential followed by high (22.50%) and low (18.75%), whereas in Yadgir district, more than three-fifth (60.00%) of them were belonged to medium level of irrigation potential followed by low (27.50%) and high (11.25%) level of irrigation potential, respectively.

Most IFS farmers had medium irrigation potential, relying on borewell irrigation for high-value crops. In Raichur and Yadgir districts, many IFS farmers had high irrigation potential due to canal irrigation from the Tungabhadra and Krishna command areas. These findings align with Gayathri (2023) and Vani (2023).

The results projected in Table 9**,** revealed that nearly more than half (50.83 %) of the farmers were categorized into medium level of innovative proneness, which is followed by low (32.08%) and high (17.08%) level of innovative proneness.

Regarding the findings from study districts within the North-Eastern Dry Zone, more than three-sixth (53.75%) of farmers belonged to medium level of innovative proneness in Kalaburagi district followed by slightly less than one-third (32.50%) and 13.75 per cent of them belonged to low and high level of innovative proneness, respectively. While, in case of Raichur district, less than half (47.50 %) of farmers belonged to medium level of innovative proneness followed by high (27.50 %) and low (25.00 %). Where as in Yadgir district, more than three-sixth (51.25 %) were classified under medium level of innovative proneness, followed by low (38.75 %) and high (10.00 %) level of innovative proneness.

Most farmers were eager to learn new farming practices and technologies to improve management and bridge knowledge gaps. These findings are supported by Ramya (2021), Vani (2023), and Madhuprasad et al*.* (2024).

Table 9. Distribution of IFS practicing farmers according to their innovative proneness

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Low (<17.39 score)	26	32.50	20	25.00	31	38.75	77	32.08
2	Medium (17.39-20.00 score)	43	53.75	38	47.50	41	51.25	122	50.83
3	High (>20.00 score)	11	13.75	22	27.50	08	10.00	41	17.08
	Total	80	100.00	80	100.00	80	100.00	240	100.00
		Mean = 18.70		SD=2.61					

Table 10. Distribution of IFS practicing farmers according to their risk orientation

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Low (<14.83 score)	15	18.75	17	21.25	24	30.00	56	23.33
2	Medium (14.83-18.72 score)	51	63.75	48	60.00	46	57.50	145	60.42
3	High (>18.72 score)	14	17.50	15	18.75	10	12.50	39	16.25
	Total	80	100.00	80	100.00	80	100.00	240	100.00
		Mean=16.78		SD=3.89					

It is clear from the Table 10 that, slightly more than three-fifth (60.42%) of the respondents had medium level of risk orientation followed by low (23.33%) and high (16.25%) level of risk orientation by a sizable percent.

With respect to the results observed in study districts of the North-Eastern dry zone, the trend indicated that slightly more than three-fifth (63.75%) of the farmers belong to medium level of risk orientation in Kalaburagi district followed by low (18.75%) and high (17.50%) levels of risk orientation. While in case of Raichur district, exactly three-fifth (60.00%) of the farmers were under medium level of risk orientation, followed by low (21.25%) and high (18.75%). Whereas in Yadgir district, 57.50 per cent of farmers had medium level of risk orientation followed by low (30.00 %) and high (12.50%) level of risk orientation, respectively.

Most IFS farmers had medium risk orientation, influenced by their personal, psychological, and economic conditions. This reflects their readiness to face risks and adopt new agricultural technologies for profitable and secure farming. These findings align with Dey et al*.* (2021), Ramya (2021), Vani (2023), and Madhuprasad et al*.* (2024).

The results projected in Table 11, revealed that less than three-fifth (55.83 %) of the farmers were categorized into medium level of achievement motivation, followed by high (22.92%) and low (21.25%) level of achievement motivation.

Based on the results from various study districts in the North-Eastern Dry Zone, slightly more than three-fifth (61.25%) of farmers had medium level achievement motivation in Kalaburagi district, followed by high (23.75%) and low (15.00%) achievement motivation. However, in Raichur district, more than three-sixth (52.50%) of respondents were under medium level of achievement motivation, which is subsequently low (25.00%) and high (22.50%) level of achievement motivation. On the other hand, in Yadgir district, more than half (53.75%) were classified under medium level of achievement motivation, followed by low (23.75%) and high (22.50%) level of achievement motivation.

Most IFS farmers had medium to high achievement motivation, being risk-takers, ambitious, and open to new ideas. This motivation helped them set and achieve goals, aligning with Shwetha (2019).

The management of different enterprises on the same piece of land and allocation of available resources among the various enterprises by the farmers play an important role in minimizing cost of cultivation for increasing net profit. From Table 12 it is clear that less than half (47.08 %) of the respondents belonged to medium level of management orientation followed by a significant per cent (27.08%) belonged to high level

Table 11. Distribution of IFS practicing farmers according to their achievement motivation

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Low (<16.54 score)	12	15.00	20	25.00	19	23.75	51	21.25
2	Medium (16.54-19.87 score)	49	61.25	42	52.50	43	53.75	134	55.83
3	High (>19.87 score)	19	23.75	18	22.50	18	22.50	55	22.92
	Total	80	100.00	80	100.00	80	100.00	240	100.00
		Mean=18.21		SD=3.33					

Table 12. Distribution of IFS practicing farmers according to their management orientation

Sl.No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Low (<46.10 score)	16	20.00	22	27.50	24	30.00	62	25.83
2	Medium (46.10-52.50 score)	39	48.75	37	46.25	37	46.25	113	47.08
3	High (>52.50 score)	25	31.25	21	26.25	19	23.75	65	27.08
	Total	80	100.00	80	100.00	80	100.00	240	100.00
		Mean=49.30		SD=6.40					

Table 13. Distribution of IFS practicing farmers according to their scientific orientation

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Low (<13.80 score)	17	21.25	22	27.50	24	30.00	63	26.25
2	Medium (13.80-18.03 score)	37	46.25	42	52.50	45	56.25	124	51.67
3	High (>18.03 score)	26	32.50	16	20.00	11	13.75	53	22.08
	Total	80	100.00	80	100.00	80	100.00	240	100.00
		Mean=15.91		SD=4.22					

management orientation and a sizable per cent had low level of management orientation (25.84%).

Considering the data from various districts in the North-Eastern dry zone, nearly three-sixth (48.75%) of the farmers had medium level of management orientation in Kalaburagi district followed by high (31.25%) and low (20.00%) levels. Whereas, more than two-fifth (46.25%) of respondents were categorized to medium level of management orientation in Raichur district and remaining were at low (27.50%) and high (26.25%) level. Although, less than half (46.25%) of respondents belonged to medium level in Yadgir district followed by low (30.00%) and high (23.75%) management orientation, respectively.

Farmers must plan, produce, and market their output efficiently, requiring strong management skills. While many had good managerial capacity, one-fourth had low ability, likely due to education, lack of IFS training, and limited experience. These findings align with Shwetha (2019), Meshram (2020), Ramya (2021), and Madhuprasad et al*.* (2024).

It is perceptible from Table 13 that slightly more than half (51.67%) of the respondents had medium level of scientific orientation followed by low (26.25%) and high (22.08%) level of scientific orientation categories.

Taking into account the data from study districts within the North-Eastern dry zone, more than two-fifth (46.25%) of respondents were under medium level of scientific orientation in Kalaburagi district which is further sequenced by high (32.50%) and low (21.25%) level of scientific orientation. Whereas, more than half (52.50%) of the farmers were classified under medium level of scientific orientation in Raichur district, followed by low (27.50%) and high (20.00%) levels of scientific orientation. However, less than three-fifth (56.25%) of respondents were belonged to medium level of scientific orientation in Yadgir district, followed by low (30.00%) and high (13.75%) scientific orientation, respectively.

The farmers' education, awareness, knowledge, and innovativeness enabled some to address field problems scientifically, using trial and error with available resources. These findings align with Ramya (2021) and Madhuprasad et al*.* (2024).

The results projected in Table 14, revealed that more than three-sixth (52.50%) of the farmers were categorized into high decision-making ability followed by low (28.75%) and high (18.75 %) decision making ability.

Considering the data from study districts within the North-Eastern dry zone, less than three-fifth (56.25%) of farmers had medium decision-

Table 14. Distribution of IFS practicing farmers according to their decision-making ability

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Low (<16.23 score)	22	27.50	22	27.50	25	31.25	69	28.75
2	Medium (16.23-22.56 score)	45	56.25	43	53.75	38	47.50	126	52.50
3	High (>22.56 score)	13	16.25	15	18.75	17	21.25	45	18.75
	Total	80	100.00	80	100.00	80	100.00	240	100.00
		Mean=19.40		SD=6.33					

making ability in Kalaburagi district followed by low (27.50%) and high (16.25%) level of decision-making ability, respectively. However, more than half (53.75%) of the farmers were categorized into medium decision-making ability in Raichur district, which is followed by low (27.50%) and high (18.75%) decision making ability. Whereas, the trend observed was nearly half (47.50%) of the respondents were under medium decision-making ability in Yadgir district which is further followed by low (31.25%) and high (21.25%) level of decision making.

Farmers with better socio-economic status tend to have higher aspirations, which drive them to gather information through mass media and improve their decision-making skills. This experience enhances their ability to utilize resources effectively. These findings are supported by Shwetha (2019) and Chandana et al. (2021).

The study observed from Table 15 showed that nearly half portion of the respondents (47.50 %) had medium level of mass media exposure, and a substantial per cent had high (32.08 %) and low (20.42%) levels of mass media exposure.

Reflecting on the data of the study districts in the North-Eastern dry zone, slightly more than half (52.50 %) of the farmers were categorized into medium level of mass media utilization in Kalaburagi district and sizable per cent of the respondents had medium (32.50 %) and low (15.00 %) level use of mass media was noticed. However, more than half (56.25%) of the farmers had medium level of mass media utilization in Raichur district and an ample per cent had high (26.25%) and low (17.50%) level of mass media utilization. Whereas, 53.75 per cent of respondents had medium level of mass media utilization in Yadgir district proceeded by low (28.75%) and high (17.50%) level.

Integrating various enterprises requires more investment, and farmers use mass media to update their technical knowledge. Sources like TV, radio, newspapers, and social media help improve awareness and keep farmers informed about the latest developments, enhancing their livelihood. These findings align with Jose (2023) and Vani (2023).

A scan at Table 16 revealed that significant (52.92%) per cent of the respondents had medium level of extension participation and a sizable per cent of the respondent farmers had low (25.00 %) and high (22.08%) levels of extension participation.

Considering the data from study area within the North-Eastern dry zone, more than three-sixth (53.75%) of the farmers were categorized into medium level of extension participation in Kalaburagi district proceeded by high (25.00%) and low (21.25%) level. However, nearly half (48.75%) of the respondents belonged to medium level of extension participation in Raichur district and remaining were at low (28.75%) and high (22.50%) level. With respect Yadgir district, slightly more than three-sixth (56.25%) of farmers were belonged to medium level of extension participation followed by low (25.00 %) and high (18.75%) extension participation, respectively.

Farmers actively participate in extension activities organized by KVKs, State Agricultural Universities, and ICAR Research Stations, seeking guidance from local extension workers to improve production and marketing. Their involvement helps them gain social recognition and identify as opinion leaders in their communities. These findings align with Argade et al. (2018), Gopika (2018), Chandana et al. (2021), and Vani (2023).

It could be perceived from the results of the findings presented in Table 17, that slightly more than two-fifth (42.50 %) of the farmers were under the categories of high level of economic motivation followed by medium (37.92 %) and low (19.58%) levels, respectively.

Table 15. Distribution of IFS practicing farmers according to their mass media utilization

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Low (<11.62 score)	12	15.00	14	17.50	23	28.75	49	20.42
2	Medium (11.62-13.37 score)	26	32.50	45	56.25	43	53.75	114	47.50
3	High (>13.37 score)	42	52.50	21	26.25	14	17.50	77	32.08
	Total	80	100.00	80	100.00	80	100.00	240	100.00
		Mean=12.50		SD=1.75					

Table 16. Distribution of IFS practicing farmers according to their extension participation

Sl.No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Low (<11.99 score)	17	21.25	23	28.75	20	25.00	60	25.00
2	Medium (11.99-13.60 score)	43	53.75	39	48.75	45	56.25	127	52.92
3	High (>13.60 score)	20	25.00	18	22.50	15	18.75	53	22.08
	Total	80	100.00	80	100.00	80	100.00	240	100.00
		Mean=12.80		SD=1.61					

Table 17. Distribution of IFS practicing farmers according to their economic motivation

Sl. No.	Categories	Kalaburagi (n=80)		Raichur (n=80)		Yadgir (n=80)		Overall (n=240)	
		f	%	f	%	f	%	f	%
1	Low (<21.56 score)	14	17.50	15	18.75	18	22.50	47	19.58
2	Medium (21.56-24.24 score)	25	31.25	27	33.75	39	48.75	91	37.92
3	High (>24.24 score)	41	51.25	38	47.50	23	28.75	102	42.50
	Total	80	100.00	80	100.00	80	100.00	240	100.00
		Mean=22.90		SD=2.68					

Taking into account the data of the study districts in the North-Eastern dry zone, slightly more than three-sixth (51.25%) of the respondents were under high level of economic motivation in Kalaburagi district, afterward medium (31.25%) and low (17.50%) levels, respectively. Conversely, nearly half (47.50%) of the respondents were under high level of economic motivation in Raichur district, subsequently medium (33.75%) and low (18.75%) levels. In contrast, nearly half (48.75%) of the respondents were belonging to medium level of economic motivation in Yadgir district followed by high (28.75%) and low (22.50%) levels, respectively.

Farmers with medium income levels focus on profit maximization and effectively utilizing resources through IFS, leading to high economic motivation. These findings align with Dey et al. (2021), Ramya (2021), and Vani (2023).

4. CONCLUSION AND RECOMMENDATIONS

The study reveals that Integrated Farming System (IFS) practitioners in the North-Eastern Dry Zone are predominantly middle-aged, educated up to the pre-university level and have moderate farming experience. Family size is mostly medium, with a significant proportion of farmers in the medium-income and medium land-holding categories. Most farmers exhibit medium cropping intensity, irrigation potential, innovative proneness, risk orientation and achievement motivation. These factors contribute to their effective involvement in IFS, enabling better decision-making and enhanced farm productivity. The findings align with previous studies, highlighting the importance of education, experience and risk-taking in successful farming practices. This provides useful insights for policy makers to focus on education, awareness and support for medium scale farmers, which could lead to enhanced agricultural productivity and economic stability in the region.

It is recommended that policymakers focus on strengthening educational programs and providing training for IFS practitioners to improve their technical skills. Additionally, targeted financial and infrastructural support should be provided to medium scale farmers to encourage sustainable farming practices. Lastly, promoting innovative farming techniques and risk management strategies could further enhance farm productivity and resilience.

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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