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RESEARCH PAPER

Exploring the role of type B secondary agriculture activities in enhancing farm income in Karnataka

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Abstract: The study explores the role of Type B secondary agricultural activities, particularly farm diversification, in enhancing farm income in Karnataka. The study was conducted in Belagavi and Haveri districts during 2023-24, involving 120 farmers (60 each from the selected districts) engaged in diversified agricultural practices. Primary data were collected through personal interviews and descriptive statistics along with the Simpson Index of Diversification (SID) were employed to assess impact of diversification on income. The findings revealed that, integrating field crops with horticulture and livestock significantly increased farm income, with Belagavi showing higher diversification (SID=0.529) compared to Haveri (SID=0.324). However, Haveri demonstrated a greater percentage increase in average farm income (186.13%), particularly in diversified systems involving field crops, horticulture and livestock. Diversification reduced financial risks, optimized productivity and provided new revenue streams. The study underscores the importance of promoting diversification to enhance farm income and economic stability, with farmers who diversified their enterprises enjoying substantial financial benefits. This highlights the critical role of secondary agriculture in supporting the Doubling Farmers' Income initiative, emphasizing its potential to mobilize unused resources, generate employment and increase farmers' resilience against income fluctuations.

Key words: Employment, Farm diversification, Farm income, Type B secondary agriculture

Introduction

The agricultural sector is essential for economic growth of India, with approximately 54 per cent of the country's cultivated land being dependent on rainfall. Farmers typically work for about 180 days a year, leaving a significant portion of the year idle. Since expanding land area is not practically feasible, increasing farmers' income can be achieved by improving vertical elasticity through secondary agricultural practices.

Secondary agriculture is expected to mobilize unused resources for productive use, generating additional income and employment opportunities. It involves adding value to primary agricultural products and creating new income sources for farmers. It includes activities within animal husbandry, such as dairy farming, poultry farming and sheep rearing which complement primary agricultural activities by utilizing family labor during idle periods. These activities contribute to economic growth by increasing income opportunities for farmers.

The Doubling Farmers' Income initiative classifies secondary agriculture into three types:

Type A: Value addition to the primary agricultural production system, including enterprises like nurseries for horticulture, flowers, field and forest crops, agro-tourism, turmeric powder production, assaying, *etc*.

Type B: Alternative enterprises that generate revenue without competing for the same resources used in primary agriculture, such as farm diversification, beekeeping, hydroponics, broomstick production, sericulture, *etc*.

Type C: Enterprises that rely on agricultural waste and crop residues, including income-generating activities that utilize residues from field crops, horticulture, animal products, and forest produce. Examples include products made from cotton stalks, wheat husks, areca nut leaves, *etc.* (Anon, 2018)

Given the potential of secondary agriculture to enhance farmers' income, this study aims to explore the role of Type B secondary agricultural activities in enhancing farm income in Karnataka and to assess the impact of secondary agriculture on farmers' income, identify prevalent practices and provide insights into its economic prospects in the region.

Materials and method

The study was conducted in Belagavi and Haveri districts of Karnataka. The districts were selected purposively based on the number of small-scale units, Belagavi was among the top three and Haveri among the bottom three districts in Karnataka. Sixty farmers each from the two selected districts were randomly selected for Type B secondary agriculture activities (farm diversification). Thus, in all, a sample of 120 respondents was selected for the present study.

The study was based on the primary data, pertaining to the agricultural year 2023-24, which were gathered from selected sample farmers using pre-tested and well-structured schedule through personal interview method.

Descriptive statistical tools like percentage, mean, etc were employed to analyse the contribution of farm diversification to farm income. Simpson Index of Diversification (SID) was used to analyse the level of diversification in the study area, following the same methodology used by Suhas (2023). The Simpson Index of Diversification/SID (ranging from 0 to 1) is calculated using the following formula.

$$SID = 1 - \sum_{i=1}^{n} W_i^2 \qquad where, Wi = \frac{Xi}{\sum Xi}$$

Where,

N : total number of sources/items,

X_i : income of the i^{th} enterprise, and

W_i : proportionate income of the i^{th} enterprise in the total income.

Results and discussion

Contribution of different farm enterprises to farm income

The data in Table 1 reveals the contribution of different farm enterprises to average annual farm income. In Belagavi district, the field crops alone contributed least average annual farm income of ₹ 7,31,596, whereas, the integration of field crops, horticulture crops and livestock contributed the highest average annual farm income of ₹ 18,98,492, with share of 44.25, 37.99 and 17.76 per cent from agriculture, horticulture and livestock, respectively. This showed 159.50 per cent increment in average annual farm income over the single enterprise (field crops).

Correspondingly, in Haveri district, field crops alone generated the lowest average annual farm income of ₹ 6,49,305. In contrast, integrating field crops with horticulture and livestock resulted in the highest average annual income of ₹ 12,83,191 with agriculture, horticulture and livestock contributing 33.44, 37.99 and 17.76 per cent, respectively. This represented an increase of 186.13 per cent in income compared to field crops alone. In total, field crops alone produced the lowest average annual farm income of ₹ 6,31,716. However, the integration of field crops with horticulture and livestock resulted in the highest average annual income of ₹ 15,78,049 with contribution of 38.75, 40.41 and 20.84 per cent from agriculture, horticulture and livestock, respectively. This reflects a 149 per cent increase in income compared to relying solely on field crops.

The lower income from field crops alone in both regions highlighted the financial advantages of diversifying agricultural enterprises. Farmers who combined field crops with horticulture, livestock or horticulture were able to enhance their income by

Table 1. Contribution of different farm enterprises to farm income

Enterprise combination	f(n= 60)	Average annual farm income (₹ /HH)	Avg. Income contribution from different components (per cent)				% change in average annual farm income over single enterprise
			A(₹ /HH)	H(₹ /HH)	L(₹ /HH)	P(₹ /HH)	
Belagavi district							
Field crops (Single enterprise)	11 (18.33)	7,31,596 (100)	7,31,596 (100)	00	00	00	00
Field crops + horticulture	12 (20)	12,75,778 (100)	6,19,362 (48.54)	6,56,416 (51.46)	00	00	74.38
Field crops + livestock	21 (35)	10,44,870 (100)	6,99,097 (66.90)	00	3,45,783 (33.1)	00	42.82
Field crops + horticulture + livestock	9 (15)	18,98,492 (100)	8,39,978 (44.25)	7,21,378 (37.99)	3,37,136 (17.76)	00	159.50
Field crops + poultry	7 (11.67)	7,91,371 (100)	4,75,400 (60.07)	00	00	3,15,971 (39.93)	8.17
Haveri district							
Field crops (Single enterprise)	18 (18.33)	4,48,457 (100)	4,48,457 (100)	00	00	00	00
Field crops + horticulture	9 (20)	9,66,520 (100)	4,22,264 (43.69)	5,44,256 (56.31)	00	00	115.52
Field crops + livestock	22 (35)	6,41,306 (100)	3,61,705 (56.40)	00	2,79,601 (43.60)	00	43.00
Field crops + horticulture + livestock	7 (15)	12,83,191 (100)	4,29,123 (33.44)	5,39,034 (42.01)	3,15,034 (24.55)	00	186.13
Field crops + poultry	4 (11.67)	6,49,305 (100)	3,49,010 (53.75)	00	00	3,00,295 (46.25)	44.78
Overall							
Field crops (Single enterprise)	29 (24.17)	6,31,716 (100)	6,31,716 (100)	00	00	00	00
Field crops + horticulture	21 (17.5)	10,88,953 (100)	5,57,748 (51.21)	5,31,205 (48.79)	00	00	72.38
Field crops + livestock	43 (35.83)	8,38,400 (100)	4,85,547 (57.91)	00	3,52,853 (42.09)	00	32.72
Field crops + horticulture + livestock	16 (13.33)	15,78,049 (100)	6,11,479 (38.75)	6,46,605 (40.41)	3,19,965 (20.84)	00	149.80
Field crops + poultry	11 (9.17)	7,13,391 (100)	4,05,258 (56.80)	00	00	3,08,133 (43.20)	12.93

Note : Values in parentheses indicates percentage to respective total value f - Frequency, A - Agriculture; H- Horticulture; L- Livestock; P- Poultry, HH - Household

Table 2. Simpson Index of Diversification in the study area

Combination of enterprises	Belagavi District(n=60)		Haveri District (n=60)		Overall (n=120)	
	Mean SID	% change in average annual farm income over single enterprise	Mean SID	% change in average annual farm income over single enterprise	Mean SID	% change in average annual farm income over single enterprise
Field crops (Single enterprise)	0	00	0	00	0	00
Field crops + horticulture	0.431	74.38	0.404	115.52	0.421	72.38
Field crops + livestock	0.383	42.82	0.394	43.00	0.390	32.72
Field crops + horticulture + livestock	0.622	159.50	0.562	186.13	0.596	149.80
Field crops + poultry	0.216	8.17	0.240	44.78	0.227	12.93
Overall	0.529	-	0.324	-	0.413	-

tapping into additional revenue sources and optimizing their farm's overall productivity and resilience.

The results of the present study are in line with the findings of Debnath *et al*. (2019) who observed that integration with horticulture crops and other profitable enterprises increases the farm returns by eight to 15 times than with field crops alone.

The findings of the study are also in conformity with the findings of Theodore (1999), Santosh (2011), Khushbu (2018) and Meenakshi (2018) who observed that the net returns were significantly higher in diversified farms than in non-diversified farms and as the diversification increases, the net return also increases, simultaneously.

Simpson Index of diversification in the study area

The analysis of the Simpson Index of Diversification (SID) across the study areas revealed notable differences between Belagavi and Haveri districts as presented in Table 2. Field crops alone had no diversification (SID=0), as expected and there was no change in average annual farm income. When field crops were combined with horticulture, the SID in Belagavi was slightly higher (0.431) than in Haveri (0.404), reflecting a more diversified enterprise combination. However, Haveri showed a greater percentage increase in average annual farm income (115.52%) over a single enterprise compared to Belagavi (74.38%). Field crops combined with livestock showed a moderate level of diversification, with a SID of 0.383 in Belagavi and 0.394 in Haveri. Interestingly, the income increase was similar between districts, indicating that livestock integration had a consistent but lower impact on income compared to horticulture.

The highest diversification was observed in the combination of field crops, horticulture and livestock, with a SID of 0.622 in Belagavi and 0.562 in Haveri. This combination led to substantial increase in farm income across both districts, with Haveri (186.13%) again outperforming Belagavi (159.50%), mainly due to better coordination of diverse farming practices. Field crops combined with poultry had the lowest diversification index (0.216 in Belagavi and 0.240 in Haveri). The increase in income was minimal, particularly in Belagavi (8.17%), while Haveri showed a more significant income boost (44.78%). In total, SID was found to be highest in the combination of field crops, horticulture crops and livestock enterprises thereby indicating, more the diversification higher will be the contribution of average annual farm income.

The diversification was higher in Belagavi (SID=0.529) than in Haveri (SID=0.324), yet Haveri's diversified enterprises appeared to have had a more significant impact on average farm income. This disparity could be due to differences in market access, resource availability, and local agricultural policies. Overall, the findings underscore that, the higher farm income is associated with greater diversification, illustrating the enhanced financial stability and resources available to wealthier farmers.

Conclusion

The farm diversification significantly increased farm income, with the highest gains observed in the case of field crops integrated with horticulture and livestock. Belagavi showed higher diversification in general, but Haveri experienced greater enhancements in income. The integration of multiple enterprises enabled farmers to improve productivity, tap into diverse revenue streams and reduce financial risks. The study brought to the fore that those farmers who had diversified their farm activities, reaped substantial financial benefits, reinforcing the importance of promoting diversification as a strategy for enhancing income, resilience and economic stability in the agricultural sector.

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