**Evaluating the Impact of KVK’s Doubling Farmers’ Income (DFI) Interventions on Farmers’ Additional Income in North Karnataka, India**

**ABSTRACT**

The study evaluates the impact of Doubling Farmers' Income (DFI) interventions by Krishi Vigyan Kendras (KVKs) on additional income generation to farmers in North Karnataka. An *Ex-post facto* research design was adopted for the investigation. The study was conducted in Vijayapura (I & II) and Bagalkot districts of North Karnataka during 2023. From each district two talukas were purposively selected based on the availability of highest numbers of farmers who have adopted the technologies promoted by KVK. The study focused on key interventions: Varietal interventions and DFI interventions. The list of beneficiary farmers was obtained from the KVK’s of Vijayapura (I & II) and Bagalkot. The farmers who have adopted pigeon pea technologies varietal interventions and DFI interventions were selected through purposive sampling technique at the rate of 40 farmers for each KVK *viz.*, Vijayapura, Indi and Bagalkot. Thus, constituting a total sample of 120. The data were collected primarily through a pre-tested structured interview schedule. Benefit cost ratio was calculated by using the formula net returns divided by total cost. Findings revealed that the average additional income was found to be highest in farmers who have adopted goat and sheep as subsidiary occupation with B:C ratio more than 3.50. The adoption of improved breeds of cow and buffalo by beneficiaries had boost their additional income with B:C ratio more than 2.0. The results also witnessed that additional income by both dairy and sheep & goat was highest in KVK Bagalkot beneficiaries as compare to other two KVKs. The results underscore the effectiveness of KVK interventions in enhancing farm profitability and highlight the need for sustained support in agricultural extension services. Strengthening the access to improved technologies, training programs and market linkages will help maximize the economic benefits of these interventions.

**Keywords:** Doubling Farmers' Income, Krishi Vigyan Kendra, North Karnataka, interventions, additional income

1. **INTRODUCTION**

 Agriculture is the backbone of India's economy, contributing significantly to employment and rural livelihoods. However, the sector faces several challenges, including low productivity, market volatility, and climate-related risks, which affect farmers' income levels (Chand, 2017). In response to these challenges, the Government of India had launched the Doubling Farmers’ Income (DFI) initiative, aiming to improve agricultural productivity, reduce costs, and enhance farmers’ profitability by 2022 (Dwivedi *et al*., 2017). One of the key institutions that support this initiative is the Krishi Vigyan Kendra (KVK), which plays a crucial role in technology dissemination, capacity building, and skill development among farmers.

 KVKs have introduced various DFI interventions, including the adoption of improved crop varieties, livestock-based subsidiary occupations, farm mechanization, and market linkage programs. Studies have shown that these interventions significantly impact farm incomes by increasing yield potential, enhancing resource efficiency, and promoting diversification into allied sectors like dairy, sheep, and goat farming (Ponnusamy and Devi, 2017). Integrated farming systems (IFS), or the integration of many crops and enterprises, are the current day's answer to increasing income. It focuses on enhancing farmer profitability by improving and integrating properties, reusing wastes, and reducing chemical dependency (Reddy *et al*., 2023). In North Karnataka, where agriculture is predominantly rain-fed, the adoption of high-yielding varieties, sustainable farming practices, and integrated farming systems has shown promising results in improving farmers' economic conditions (Mandal *et al*., 2018). The ability of farmers to generate additional income through diversified activities has become a key determinant in achieving sustainable agricultural growth.

Despite the efforts of KVKs, the extent of their economic impact on beneficiary farmers in North Karnataka remains an area of research interest. Several studies have analyzed the effectiveness of various agricultural interventions, but a systematic evaluation of KVK-led DFI strategies in this region is still limited. Understanding the role of KVKs in promoting income-enhancing technologies and assessing their financial implications can help policymakers refine future agricultural extension programs (Lakshmi *et al.*, 2020). By measuring key parameters such as yield improvements, cost-benefit ratios, and net income variations among farmers, this research aims to provide empirical insights into the effectiveness of KVK interventions in achieving the DFI goal.

* 1. **OBJECTIVE**

To evaluate the impact of Doubling Farmers’ Income (DFI) interventions of KVK on additional income of farmers in North Karnataka

**2. METHODOLOGY**

The study was conducted in Vijayapura (I & II) and Bagalkot districts of North Karnataka during 2023. From each district two talukas were purposively selected based on the availability of highest numbers of farmers who have adopted the technologies promoted by the KVK. The KVK Vijayapura (I & II) and KVK Bagalkot had been promoting DFI interventions among all the KVKs. Among all the technologies of KVK two important technologies were purposively selected *viz.*, introduction of new varieties (varietal interventions) and DFI interventions. The list of beneficiary farmers was obtained from the KVK, Vijayapura (I & II) and Bagalkot. The farmers who have adopted pigeon pea technologies varietal interventions and DFI interventions were selected through purposive sampling. Pigeon pea was taken as it is the major crop in the selected region. Further, 40 farmers from each KVK namely Vijayapura, Indi and Bagalkot were selected constituting a total sample of 120. An *Ex-post facto* research design was adopted for the investigation. The data were collected primarily through a pre-tested structured interview schedule.

Further, additional income is expressed in monetary terms and it referred to net profit gained by farmer by cultivating pigeon pea and it was worked out by using the following formula

 Net returns = Gross returns – Total cost of cultivation

 Gross returns = Average yield per acre x Average market price per quintal

B:C ratio= Net returns

 Total cost

**3. RESULTS AND DISCUSSION**

**3.1 Impact of DFI interventions of KVK on additional income to beneficiary farmers**

The results on impact of Doubling Farmers’ Income interventions of KVK on additional income of farmers among the beneficiaries was delineated underadditional income through dairy, additional income through sheep and goat and additional income through varietal interventions have been presented below.

**3.1.1 Additional income through Dairy**

 The results on impact of DFI interventions of KVK on additional income through dairy is shown in Table 1. The total cost increased from Rs.29,914.00 before intervention to Rs. 58,690.00 after intervention in Vijayapura, and in Indi total cost was increased from Rs. 26,650.00 to Rs.52,920.00. Whereas in Bagalkot it has increased from Rs.24,580.00 to Rs. 46,834.00 after the interventions. Similarly Gross returns in Vijayapura have increased from Rs.92,508.00 before the intervention to Rs.1,98,294.00 after, whereas in Indi KVK there was significant increase from Rs. 84,552.00 to Rs.1,73,120.00, followed by in Bagalkot from Rs 86,540.00 to Rs.1,84,552.00 after the interventions.

With respect to net returns in Vijayapura, it has increased from Rs. 62,594.00 to Rs. 1,39,604.00 followed by in Indi from Rs. 57,862.00 to Rs. 1,20,200.00 and Bagalkot from Rs. 61,960.00 to Rs. 1,37,718.00 after interventions with respectively. Also, the B:C ratio in Vijayapura KVK improved from 2.09 to 2.38. whereas in Indi, the B:C ratio increased from 2.17 to 2.27 and with respect to Bagalkot it has increased from 2.52 to 2.94 before and after the interventions respectively.

The results suggested that the interventions by KVK in dairy farming had a positive impact on the income and profitability of farmers of Vijayapura, Indi, and Bagalkot. While there was an increase in total costs, the substantial increase in gross returns, net returns, and the B:C ratio indicated that these investments were justified and resulted in improved financial conditions for dairy farmers. The present findings are similar to the findings of Meena and Singh (2017) and Singh and Bisen (2020).

**Table 1. Additional income through Dairy (in** **₹)**

|  |  |
| --- | --- |
| **Interventions** | **Introduction of livestock along with pigeon pea** |
| **Particulars** | **DFI Beneficiaries of KVK** |
| **Vijayapura(n1=40)** | **Indi(n2=40)** | **Bagalkot(n3=40)** |
| **Before****(Crop)** | **After****(Crop + Livestock)** | **Before****(Crop)** | **After****Crop + Livestock)** | **Before****(Crop)** | **After****Crop + Livestock)** |
| Total Cost | 29,914.00 | 58,690.00 | 26,650.00 | 52,920.00 | 24,580.00 | 46,834.00 |
| Gross Returns | 92,508.00 | 1,98,294.00 | 84,512.00 | 1,73,120.00 | 86,540.00 | 1,84,552.00 |
| Net Returns | 62,594.00 | 1,39,604.00 | 57,862 | 1,20,200.00 | 61,960.00 | 1,37,718.00 |
| B:C Ratio | 2.09 | 2.38 | 2.17 | 2.27 | 2.52 | 2.94 |

**3.1.2** **Additional income through Sheep and Goat**

The results on additional income through sheep and goat is shown in Table 2 indicating that total cost of introducing sheep and goat in Vijayapura was Rs.24,513.00 and in Indi total cost was Rs.22,610.00, followed by in Bagalkot Rs.21,905.00 after the interventions. Gross returns in Vijayapura were Rs.1,10,115.00. whereas in Indi KVK it was Rs.1,08,400.00 and followed by Rs 1,07,500.00 in Bagalkot.

With respect to net returns after introduction of sheep and goats was Rs.85,602.00 in Vijayapura, followed by Rs. 85,790.00 in Indi and Rs. 85,595.00 Bagalkot. The B:C ratio after the intervention in Vijayapura KVK was 3.50, followed by Indi KVK the B:C ratio after intervention was 3.79 and in Bagalkot B:C ratio was 3.90.

The higher gross returns indicated that, in all three regions experienced an increase in gross returns after the intervention. This indicated that sheep and goat farming were profitable in these areas. The net returns in all three regions were positive, indicating that the income generated from sheep and goat farming exceeded the total cost of the intervention. The B:C ratio is a measure of the profitability of the intervention. This could be due to factors such as local market conditions, management practices, or resource availability. The introduction of sheep and goat farming in these regions was a successful intervention that led to increased income and profitability for farmers. The present findings are in line with Ranjit *et al.* (2018) and Singh *et al.* (2018).

**Table 2. Additional income through Sheep and Goat**

|  |  |
| --- | --- |
| **Particulars** | **Introduction of Sheep and Goats** |
| **DFI Beneficiaries of KVK** |
| **Vijayapura(n1=40)** | **Indi(n2=40)** | **Bagalkot(n3=40)** |
| Total Cost | 24,513.00 | 22,610.00 | 21,905.00 |
| Gross Returns | 1,10,115.00 | 1,08,400.00 | 1,07,500.00 |
| Net Returns | 85,602.00 | 85,790.00 | 85,595.00 |
| B:C Ratio | 3.50 | 3.79 | 3.90 |

**3.1.3 Additional income through varietal interventions**

The Table 3 revealed that performance of two different crop varieties, Gulyal local and TS-3R of pigeon pea, in terms of yield, price, cost of cultivation, net returns, gross returns and B:C ratio. With respect to yield TS -3R got more yield / acre (6.31q) compare to Gulyal local variety (4.96q) with percent increase in yield about (50.31 %). Whereas in terms of price Gulyal local Rs. 6200/q and TS-3R Rs. 6300/q with percent increase of (1.61 %). Similarly, cost of cultivation for Gulyal Rs. 11463/acre and Rs.12652/acre for TS-3R with % increase in cost of cultivation 10.37 per cent.

 With regard to Gross returns obtained from Gulyal local was Rs.30,752/acre whereas TS-3R gained Rs.39,753/acre with percentage increase about (29.26 %) and net returns gained from Gulyal local is about Rs. 30­752/acre and from TS-3R its around Rs. 39753/acre with percentage increase of (40.50 %). Hence the B:C ratio for Gulyal local was 1.68 and for TS-3R 2.14. with percentage increase of 27.38 per cent.

The results suggested that TS-3R outperforms Gulyal local in terms of yield, price, gross returns, net returns, and the B:C ratio. Despite having a slightly higher cost of cultivation, TS-3R's is significantly higher yield and better price result in higher profitability. Farmers may consider shifting to TS-3R if these results are consistent over a period of time. However, other factors such as pest resistance, environmental considerations, and local market demand should also be taken into account when making crop selection decisions.

##### **Table 3: Impact of the varietal interventions of KVK on income of pigeon pea growers:**

#####  **(n= 120)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Varieties** | **Gulyal local** | **TS-3R** | **% increase** |
| Yield (q/acre) | 4.96 | 6.31 | 50.31 |
| Price (Rs/q) | 6200 | 6300 | 1.61 |
| Cost of cultivation (Rs/acre) | 11463 | 12652 | 10.37 |
| Gross returns (Rs/acre)) | 30752 | 39753 | 29.26 |
| Net returns (Rs/acre)) | 19289 | 27101 | 40.50 |
| B:C | 1.68 | 2.14 | 27.38 |

**4. CONCLUSION**

The study highlights the significant role of Krishi Vigyan Kendras (KVKs) in enhancing farmers' additional income through targeted Doubling Farmers’ Income (DFI) interventions in North Karnataka. The adoption of improved dairy breeds, sheep and goat farming and high-yielding crop varieties has contributed to substantial increases in farmers' income. The results indicate that farmers engaged in livestock-based subsidiary occupations, particularly in sheep and goat farming, achieved the highest benefit-cost (B:C) ratio, demonstrating the profitability and viability of diversified farming practices. Additionally, the introduction of improved crop varieties resulted in higher yields and increased profitability, further validating the importance of technological interventions in agriculture.

The findings emphasize the need for continued support and expansion of KVK-led initiatives to ensure sustainable income growth for farmers. Strengthening access to improved technologies, training programs, and market linkages will help maximize the economic benefits of these interventions. Moreover, policymakers should focus on creating the environment that enables farmers to adopt integrated farming systems, which not only enhance income but also improve resilience against climate and market uncertainties. Increased investment in agricultural extension services and financial support mechanisms can further accelerate income growth and economic stability for smallholder farmers.

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