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Impact assessment of village adoption programme (VAP) interventions on production, income, and livelihood security

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Abstract

Krishi Vigyan Kendra, Tiptur, Tumkur made a concerted effort to assess the influence of technological interventions initiated through the "Village Adoption Program (VAP)". The VAP aims to boost agricultural production, encourage farmers to adopt scientific farming practices, and enhance their understanding of technological options to uplift their socio-economic status. In this context, Chikkahonnavalli village of Tumkur district was selected as the adopted village under VAP for a period of three years (2019-2022). Initially, the majority of farmers lacked awareness of scientific cultivation practices, improved crop varieties, and modern production technologies. Following KVK interventions and the supply of critical inputs, farmers were motivated to enhance their knowledge and adopt advanced agricultural technologies. These efforts significantly reduced drudgery in field operations and improved farmers' understanding of animal rearing and scientific crop management through a series of training programs, capacity-building activities, on-field demonstrations, and dissemination of educative extension materials. A key highlight of the intervention was the promotion of backyard nutritional kitchen gardening, which added to household nutritional security. As a result of these comprehensive efforts, there was a notable rise in farmers' awareness, empowerment, and capacity to utilize available resources effectively. Crop diversification using improved varieties, coupled with integration of livestock components, led to enhanced productivity and profitability, particularly for small and marginal farmers. Consequently, the total agricultural income of the village rose from Rs. 1.31 crore to Rs. 1.82 crore, and the per capita income of farm households increased by 39.12%, from Rs. 79,035 to Rs. 1,09,955. All these positive transformations were made possible due to the successful implementation of the Village Adoption Programme.

Keywords: Village Adoption Programme (VAP), Technological interventions, Knowledges and impact

Introduction

Mahatma Gandhi once said, "If the village perishes, India will perish too," highlighting the pivotal role of rural communities in shaping the nation's socio-economic and cultural landscape. Villages, typically defined as rural settlements with populations ranging from 500 to 2,500, form the bedrock of India's agricultural economy and are repositories of traditional knowledge and community values. To bridge the gap between academic knowledge and grassroots realities, the University Grants Commission (UGC) has mandated universities to incorporate an extension component in their activities. In response, State Agricultural Universities (SAUs), KrishiVigyanKendras (KVKs), and ICAR institutes have initiated Village Adoption Programs to integrate teaching, research, and extension with field-level realities.

The Village Adoption Programme (VAP) is a holistic approach that immerses students, researchers, and extension professionals in rural settings. It focuses on understanding the sustainable use of natural resources, local development needs, and the aspirations of village communities. This participatory model promotes rural innovation, community empowerment, and the replication of successful practices through collective action.

As part of this initiative, every KVK under the University of Agricultural Sciences (UAS), Bangalore, is tasked with adopting a village for a three-year cycle. In this regard, ICAR-KVK, Tiptur adopted Chikkahonnavalli village in Tiptur Taluk, Tumakuru District, for the period 2019-2020 to 2021-22, with support from UAS, Bangalore. The program aimed to promote integrated agricultural development, capacity building, and sustainable livelihood interventions tailored to local conditions.

Chikkahonnavalli is a medium-sized village with 166 families and a population of 675, with a literacy rate of 76.30 per cent as per the 2011 Census. The village features diverse agricultural practices, with farmers cultivating crops such as finger millet, maize, redgram, greengram, blackgram, field bean, chickpea, castor, banana, and coconut. Livestock farming is also prominent, with significant cattle and poultry populations.

Given this context, assessing the impact of the Village Adoption Programme on farmers' knowledge and adoption of improved crop production practices is crucial for evaluating the effectiveness and long-term relevance of the intervention.

Methodology

An ex-post facto research design was employed to assess the impact of the Village Adoption Programme (VAP) on

farmers' knowledge and adoption of crop production and allied enterprises in Chikkahonnavalli village, Tiptur Taluk, Tumakuru District, during the period 2019-20 to 2021-22.

Data was collected from 90 respondents who had consistently benefited from the VAP over the three-year period. A pre-post method of data collection was followed. The initial data was gathered before the implementation of the programme as part of a baseline survey, and the second round of data collection was conducted after the programme's completion.

A personal interview method was employed using a structured interview schedule. The collected data was analyzed using mean scores and frequency distribution to assess changes in knowledge and adoption levels among the beneficiaries.

Results

Table 1: Socio-economic profile of the selected famers in adopted Village (n=90)

Sl. No.	Characters	No.	Per cent
1	**Age (years)**		
	< 30	22	24.44
	31 to 50	35	38.89
	> 51	33	36.67
2	**Education**		
	Degree	11	12.22
	PUC	20	22.22
	High school	25	27.77
	Primary	28	31.11
	Illiterate	06	6.66
3	**Type of Family**		
	Nuclear	67	74.44
	Joint	23	25.55
4	**Size of the Family (members)**		
	1-3	32	35.55
	4-6	46	51.11
	> 7	12	13.33
5	**Annual Income (Rs.)**		
	<24,999	12	13.33
	25,000-75,000	48	53.33
	>75,000	30	33.33

Table 1 presents the socio-economic profile of the 90 farmers selected under the Village Adoption Programme (VAP) in Chikkahonnavalli village. The data shows that the majority of farmers (38.89%) belonged to the middle-age group of 31 to 50 years, followed closely by those above 51 years (36.67%). This indicates that most participants were in their productive farming years, with enough experience to understand and adopt improved agricultural practices. A younger segment (<30 years) also accounted for 24.4 per cent, reflecting potential for youth involvement in future agricultural development efforts.

In terms of education, a significant portion of the farmers had received formal education 27.77 per cent had completed high school, and 22.22 per cent had passed PUC, while 12.22 per cent were graduates. This indicates a moderate literacy level, supporting the adoption of new technologies. However, 6.66 per cent were illiterate, underscoring the need for visual or field-based demonstrations to ensure inclusivity.

Regarding family structure, 74.44% of the households were nuclear families, a trend common in modern rural settings. In terms of family size, 51.11 per cent had 4-6 members, which is ideal for managing small to medium-scale farm operations, while 35.55 per cent had 1-3 members, indicating labour constraints for larger-scale farming unless supplemented by hired labor. On income levels, 53.33 per cent earned between Rs.25,000 and Rs.75,000 annually, and only 33.33 per cent crossed the Rs. 75,000 mark, reflecting the need for income-enhancing interventions through agriculture and allied activities. The results are in concurrent with the Vivek and Sahana (2021) [7].

Table 2: Possession of Land, Livestock and House hold materials (n=90)

Sl. No	Characters	No.	Per cent
1	**Land holding**		
	Marginal farmers (<2.5 acre)	47	52.22
	Small farmers (2.5 - 5 acre)	20	22.22
	Medium farmers (5 - 10 acre)	13	14.44
	Large farmers (> 10 acre)	10	11.11
2	**Livestock possession ***		
	Buffalo	12	13.33
	Cow	75	83.33
	Poultry	49	54.44
	Sheep &Goat	24	26.66
3	**House hold material possession***		
	Television	91	92.22
	Bicycle	40	44.44
	Motor cycle	62	68.88
	Mobile	82	91.11
	Gas	75	83.33
	Pressure cooker	58	64.44
4	**Housing condition**		
	Katchha (Straw) house	7	7.77
	Tiled house	58	64.44
	Pucca (RCC) house	25	27.77

* Multiple responses

Table 2 sheds light on farmers' landholding status, livestock ownership, and household assets. A majority were marginal farmers (52.22%) owning less than 2.5 acres, followed by small farmers (22.22%). Only 11.11 per cent were large farmers, confirming that most programme beneficiaries belonged to economically weaker sections. Despite limited land, many had diversified into allied activities, with 83.33 per cent owning cows, 54.44 per cent keeping poultry, and 26.66 per cent engaged in sheep and goat rearing, indicating the importance of livestock as a secondary income source.

Asset ownership reveals a reasonably good level of household amenities. Most households possessed mobiles (91.11%), televisions (92.22%), and gas connections (83.33%), which suggests access to communication, entertainment, and clean cooking energy. Motorcycles (68.88%) and pressure cookers (64.44%) were also common, improving mobility and cooking efficiency. However, only 44.44 per cent owned bicycles, possibly due to preference for motorized transport. Housing data shows that 64.44 per cent lived in tiled houses, and 27.77 per cent in RCC houses, reflecting modest but decent living standards, while only 7.77 per cent were in katchha houses, highlighting a small section that may require housing support.

In summary, the socio-economic profile indicates that the

majority of the farmers were small and marginal with moderate education levels, sufficient family labor, and reasonable access to basic amenities and livestock. These characteristics provided a strong foundation for the successful implementation and uptake of improved agricultural practices under the Village Adoption Programme. The data also emphasizes the need for continued support in income generation, education, and housing to ensure equitable rural development. The results are in line with the Kowsalya (2017) [3].

Table 3: Impact of Project Interventions on Adoption of New Technologies through Demonstrations

Crop/Technology Area	Earlier Practice / Old Technology	New Technology Introduced through Demonstration
Ragi	Varieties: GPU-28 & Indaf-9	Improved Varieties: ML-365, MR-6
Redgram	Varieties: BRG-1 & BRG-2	Improved Variety: BRG-5
Redgram Nutrient Management	Use of only chemical fertilizers	Application of bio-stimulant "Pulse Magic"
Drumstick	Local variety	High-yielding Variety: Bhagya
Papaya	Local variety	Improved Variety: Red Lady
Guava	Local variety	Improved Variety: Allahabad Safed
Lime	Local variety	Improved Variety: Balaji
Fodder Crops	Traditional types: Jowar, Napier	High-yielding Varieties: COFS-29 and COFS-31
Cattle Health Management (Deworming)	Irregular and improper dosage of syrup	Recommended dosage of *Panacure* for effective deworming
Cattle Feeding Management	Feeding only concentrate feed	Addition of mineral mixture (*Cal Sagar* and *Nutracell Power*) with feed concentrate
Brinjal Crop Protection	Only chemical fertilizer application	Introduction of Arka Microbial Consortium (AMC)
Seed Treatment for Cereals & Pulses	No seed treatment followed	Seed treatment using *Azospirillum* and *Rhizobium*
Coconut Stem Bleeding Management	Use of lime or Bordeaux paste	Root feeding with *Hexaconazole* along with Bordeaux paste
Whitefly Management in Coconut (Young)	No specific management practices	Installation of yellow sticky traps, neem oil spray, *Isaria* fungus application
Vegetable Crops Nutrition	Only use of chemical fertilizers	Application of *Vegetable Special* foliar spray along with integrated crop management
Ganoderma Wilt in Coconut	Cutting and burning of infected trees	Root feeding with *Hexaconazole* and Integrated Crop Management (ICM) practices

Table 3 highlights the technological shift among farmers as a result of targeted demonstrations. The VAP facilitated the replacement of traditional, less productive varieties and practices with improved, high-yielding, and resource-efficient alternatives. For instance, GPU-28 in ragi was replaced with ML-365 and MR-6; local papaya varieties were replaced with 'Red Lady'; and traditional lime varieties with 'Balaji'. Moreover, there was a significant move toward integrated nutrient and pest management, seed treatment with bio-fertilizers, and improved livestock management practices. This shift indicates enhanced responsiveness of farmers towards sustainable and scientifically-backed interventions.

Table 4: Extension activities conducted to create awareness and up-scale the technologies

Sl. No.	Activity	No. of Programmes	No. of Participants
1	Animal health camps	6	339
2	Soil health camps	1	45
3	Human health camps	-	-
4	Exposure visits	3	170
5	Field days	6	232
6	Important day/ events celebration	4	262
7	Nutrigarden Demonstration	1	30
8	Group Discussions	4	96
9	Training programme	23	914
10	Follow-up visits	140	1197

Table 4 documents the scale of capacity building and awareness programs conducted. A total of 23 training programmes reached 914 farmers, complemented by 140 follow-up visits**,** animal and soil health camps**,** and exposure visits**.** These events played a critical role in enhancing knowledge, building trust, and reinforcing technology adoption.

Table 5: Distribution of respondents according to their Knowledge level (n=90)

Sl. No	Category	Before		After	
		Frequency	Percentage	Frequency	Percentage
1	Low	44	48.88	9	10.00
2	Medium	28	31.11	25	27.77
3	High	18	20,00	56	62.22
Mean= 62.13, SD=5.23				Mean= 79.80, SD=7.19	

The data in Table 5 clearly revealed a significant improvement in the knowledge level of beneficiary farmers after the implementation of the VAP. Prior to the intervention, 48.88 per cent of farmers were in the low knowledge category, which reduced to just 10 per cent post-intervention. Conversely, the proportion of farmers with high knowledge increased from 20.00 to 62.22 per cent. The mean knowledge score increased from 62.13 to 79.80, indicating a substantial positive impact of the program on farmers' awareness and understanding of improved agricultural practices. This improvement may be attributed to the regular training, field demonstrations, and exposure visits organized during the programme. The results were in line with the HemaSarat Chandra *et. al.,* (2017) [1] and Jeyaseelan (2010) [2].

Table 6: Distribution of respondents according to their Adoption level (n=90)

Sl. No	Category	Before		After	
		Frequency	Percentage	Frequency	Percentage
1	Low	54	60	16	17.78
2	Medium	26	28.89	31	34.44
3	High	10	11.11	43	47.78
Mean= 59.08, SD=5.01				Mean= 76.51, SD=5.93	

Table 6 revealed that there was a significant shift in the adoption behavior of farmers. The high adoption category increased from 11.11 to 47.78 per cent, indicating that nearly half of the farmers moved to consistent use of recommended practices. This reflects the success of field demonstrations, which not only showcased new technologies but also allowed farmers to observe the benefits first hand over multiple seasons.

Importantly, the transition from low adoption (60.00 per cent before to 17.78 per cent after) signals an attitude change and growing confidence among farmers in embracing science-led farming. The mean adoption score rose from 59.08 to 76.51, showing that the programme was not only informative but also actionable. Similar results were found by Montes De Oca Munguia *et al*., 2021 [5].

Table 7: Adequacy of food intake before and after Nutri garden (n=30)

Particulars	RDA	Before		After		Per cent increase
	(g/ml)	Mean±SD	% Adequacy	Mean±SD	% Adequacy	
Cereals	330 g	288.33±36.01	87.37	304.16±30.17	92.16	4.79
Pulses	75 g	58.16±11.04	78.21	62.16±9.97	82.88	4.67
Milk & its products	300 ml	184.33±90.88	61.44	209.66±55.24	69.88	8.44
Roots and tubers	200g	64.23±46.18	32.11	69.00±37.81	34.5	2.39
Glv	100g	93.66±29.73	93.66	95.33±28.09	95.33	1.67
Other vegetables	200g	116.00±37.35	58.00	140.33±31.86	70.16	12.16
Fruits	100g	58.83±9.25	58.83	72.83±25.58	72.83	14
Sugars	30g	33.93±18.08	113.1	28.93±12.34	96.43	-16.67
Fats	25g	36.26±29.06	145.04	27.00±7.94	108	-37.04

Table 8: Crops/Livestock Produced In Nutri Garden

Details	Kharif	Rabi	Summer	Total (Kgs)
Quantity of GLV Produced (No. of Bundles)	310	580	432	1,322
Quantity of other vegetables Produced (Kg)	856	915	975	2,746
Farm Families	Total expenditure (Rs/year)		Savings (Rs/year)	% Savings
	Before	After		
30 Families	264000	105000	159000	60.23
Per Family	8,800	3500	5300	

Tables 7 and 8 underscore the nutritional benefits of establishing household Nutri Gardens. Intake of essential food groups such as milk, fruits, and vegetables showed a noticeable increase in adequacy. The fruit adequacy improved by 14.00 per cent, and vegetable intake improved by over 12.00 per cent, which is significant considering the rural context where market access and dietary diversity are often limited.

Additionally, the reduction in sugar (-16.67%) and fat intake (-37.04%) indicates a shift toward healthier food habits, driven by awareness created during training sessions. The increased consumption of green leafy vegetables (GLVs), which reached 1,322 bundles across 30 families, played a critical role in improving micronutrient intake, particularly iron, calcium, and vitamin A.

The economic benefit of the Nutri Garden is also evident from the reduction in household expenditure from Rs.8,800 to Rs.3,500 per family per year resulting in over 60% savings. This demonstrates that Nutri Gardens served a dual purpose: improving food security and reducing financial burden on low-income families.

Table 9: Economic impact of project interventions at village level **(n=90)**

Crops	Area (ha)		Yield (Q/ha)		Total Production (Q)		Total income (Rs.)	
	Before	After	Before	After	Before	After	Before	After
Ragi	96	108	17.50	20.50	1680	2214	4872000	6420600
Redgram	36	41	7.55	8.97	271.8	367.77	1467720	1985580
Cowpea	16	19	6.85	7.80	109.6	148.2	931600	1259700
Field bean	22	26.5	6.50	7.60	143	201.4	772200	1136160
Drumstick	10	12.25	44	52.5	440	643.125	814000	1189781
Pappaya	5	7	270.00	340.00	1350	2380	945000	1645000
Coconut	41.2	43.2	6250	7600	286.111	364.8	2732360	3483840
Fodder crops (in tones)	4.5	7.5	130	151	585t	1132t	585000	1132000
Total cash inflow							1,31,19,880	1,82,52,661
Per capita income of the farm house hold							79,035	109955
% change in per capita income of the farm house hold and village level							39.12%	

The data presented in Table 9 clearly highlights the positive economic impact of the Village Adoption Programme (VAP) on the agricultural productivity and income levels of farmers in Chikkahonnavalli village. Across all major crops, there was a noticeable increase in both the area under cultivation and the yield per hectare after the implementation of the programme. For example, the yield of ragi increased from 17.5 to 20.5 quintals/ha, resulting in an income rise from Rs.48.72 lakh to Rs.64.20 lakh. Similar improvements were recorded in redgram, cowpea, field bean, and other crops due to the introduction of high-yielding varieties and improved agronomic practices.

Significant gains were observed in horticultural crops as well. Income from papaya cultivation nearly doubled from Rs.9.45 lakh to Rs.16.45 lakh—and drumstick income increased from Rs.8.14 lakh to Rs.11.89 lakh, reflecting the successful introduction of commercial varieties like 'Red Lady' papaya and 'Bhagya' drumstick. In coconut, a vital commercial crop in the region, yield improvements were achieved through interventions such as Hexaconazole root feeding, biological pest control, and nutrient management, resulting in an income increase from Rs.27.32 lakh to Rs.34.83 lakh.

Additionally, fodder production improved significantly, with output rising from 585 to 1132 tonnes, benefiting livestock productivity and supporting increased milk yield and animal health. The total agricultural income of the village rose from Rs. 1.31 crore to Rs. 1.82 crore, and the per capita income of farm households increased by 39.12%, from Rs.79,035 to Rs. 1,09,955.

The success of these economic outcomes can be attributed to several key factors. Firstly, the systematic need-based interventions ranging from varietal replacement to integrated crop and livestock management ensured that farmers received technologies tailored to their agro-climatic and socio-economic conditions. Secondly, continuous handholding support through trainings, field demonstrations, and follow-up visits built the farmers' confidence to adopt and sustain improved practices. Thirdly, the active participation of farmers in on-field demonstrations helped in better understanding and quicker adoption of the technologies. Furthermore, the use of scientific crop planning, improved access to quality inputs, and promotion of integrated farming systems created a more resilient and diversified farming approach.The results were on par with the Manjunath*et.al.,* (2019) [4] and Sadvi*et.al.,* (2020) [6].

Table 10: Economic impact on household/farmers (n=90)

Income category	Before intervention (f)	After intervention (f)
Low (<Rs.50000)	19	8
Medium (Rs. 50000-150000)	51	54
High (> Rs.150000)	20	28

Table 10 illustrates a clear shift in the income distribution among beneficiary households. The number of families in the high-income bracket (>Rs.1.5 lakh) rose from 20 to 28, while those in the low-income category (<Rs.50,000) fell from 19 to 8. This upward mobility reflects improved returns from diversified agricultural enterprises and better resource management.

Furthermore, the fact that a majority moved into the middle-income group (Rs.50,000-1,50,000) suggests a broad-based impact rather than concentrated benefits. Such inclusive growth is essential for long-term rural development and sustainability.

The shift can be attributed to several contributing factors. Firstly, the adoption of high-yielding and market-preferred crop varieties**,** combined with scientific crop management techniques, led to increased productivity and farm income. Secondly, integrated farming systems that included horticulture, fodder cultivation, and livestock activities provided multiple income streams, reducing reliance on a single crop and increasing economic resilience. Thirdly, the Nutri Garden initiative helped reduce household food expenses while contributing to nutrition and self-sufficiency, indirectly increasing disposable income. Additionally, continuous capacity building, demonstrations, and personalized support from the KVK improved farmers' decision-making, risk management, and marketing capabilities.

Conclusion

The Village Adoption Programme has proven to be a highly effective approach for accelerating the dissemination and adoption of advanced agro-technologies within a defined timeframe. By serving as a live demonstration site, the adopted village becomes a platform to showcase the tangible benefits of modern agricultural practices tailored to local agro-ecological conditions. In this context, the adoption of Chikkahonnavalli village by ICAR-KVK, Tiptur, in Tumkur District, has yielded remarkable results.

Through a comprehensive set of interventions including crop demonstrations, input support, capacity building, integrated farming systems, pest and disease management, health and nutrition campaigns, and on-field diagnostics—KVK scientists, in collaboration with farmers and line departments, successfully enhanced awareness, productivity, and profitability. These efforts not only improved the livelihoods of the participating farmers but also led to a noticeable upliftment in their overall socio-economic status.

Chikkahonnavalli now stands as a model village, exemplifying the power of participatory extension, farmer-scientist collaboration, and continuous handholding. The experience highlights the need to scale up such initiatives, extending their reach to more villages to foster sustainable rural development and inclusive agricultural growth across regions.

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