

IMPACT OF VILLAGE ADOPTION PROGRAM ON CROP NUTRIENT MANAGEMENT PRACTICES: AN ACTION RESEARCH

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ABSTRACT

To empower farmers on new agricultural technologies Village Adoption Program was initiated in the year 2018 by the Regional Agricultural Research Station, Warangal, PJTAU. In baseline survey conducted in the adopted village, a knowledge gap was identified among farmers in crop nutrient management. Though the crop yields are on par with the average yields of the locality, the expenditure on crop nutrient management is on the higher side due to non-technicality in fertiliser management. Hence, to correct this gap, various Extension interventions were implemented for three years. After three years, thirty randomly chosen farmers from the adopted village were re-interviewed to assess their existing crop nutrient management practices. By application of paired t-test, it is found that there is a significant improvement in technical knowledge regarding crop nutrient management, Organic manure application, following scientific recommendations, and it was also noticed that village adoption program helped in improving their advisory seeking behaviour leading to higher yields.

KEYWORDS : Impact of Village Adoption, Knowledge gap, Nutrient management practices of farmers.

Village adoption is the most effective way to showcase the benefits of improved crop practices through effective transfer of technology within the stipulated adoption period (Samdarshi and Singh, 2018). In India, several Non-Governmental Organisations, financial institutions, Krishi Vigyan Kendras, and ICAR institutes have reported the positive impact of technology transfer in their respective village adoption approaches (Chandra *et al.*, 2017). Recent study also confirms that systematic extension interventions under Village Adoption Programmes significantly increased farmers' awareness, knowledge, and adoption of improved production technologies, leading to higher income and livelihood security (Darshan ME, Govinda Gowda V, Shivappa Nayaka HB, Satisha HS, 2025). Akinola *et al.* from Nigeria in 2013 revealed that the average income per hectare generated and the average value of assets owned by farmers are statistically significant due to village adoption since 2011. Village adoption has substantially impacted the knowledge and adoption of improved diversified agriculture (Singh *et al.*, 2018). The Village Adoption Programme (VAP) has been shown to significantly uplift the socio-economic conditions of rural farming communities by promoting scientific farming techniques, increasing crop diversification, and integrating livestock

activities, which collectively raise household incomes (Shivashankar M, 2023). Keeping the scientific evidence regarding village adoption in mind, the Regional Agricultural Research Station, Warangal, of Professor Jayashankar Telangana Agricultural University (PJTSAU) adopted a village named Seetharampuram, Damara Mandal, Warangal (Rural), in 2018. The Village Adoption Programme was effectively utilised to integrate students, researchers, and extension professionals into rural settings, leading to enhanced understanding of local challenges and accelerated adoption of scientific practices (Singh S, Gupta MK, 2025). 203 representative soil samples were randomly collected and analysed; a baseline survey was conducted to understand existing crop nutrient management practices.

MATERIAL AND METHODS

A baseline survey was conducted in adopted village during 2018 to identify the agricultural gaps that persisted in the village of Seetharampuram. The survey revealed the gaps in knowledge of farmers on crop nutrient management practices. Similar results were reported by Mohit *et al.*, 2024. Hence, to address this problem, various extension interventions, such as focused group discussions, demonstrations, farmer tours, and peripatetic team

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visits were implemented from 2018 to 2020. This study was conducted with the following hypothesis.

H_0 : There is no significant improvement in parameters considered in crop nutrient management practices due to the village adoption program.

H_1 : There is a significant improvement in parameters considered in crop nutrient management practices due to the village adoption program.

Seetharampuram village has a population of 820, constituting 203 farm families, from which 30 farmers were selected as respondents. A semi-structured interview schedule was developed. Data were collected before and after various extension interventions during the village adoption period. Extension interventions such as on-field demonstrations, capacity-building trainings, and advisory services have been found to effectively

reduce farmer excessive reliance on chemical fertilisers by encouraging organic manure use and balanced nutrient application, which improved soil health and crop productivity (Jha AK, Kumar A, Mehta BK, Kumari M, Chatterjee K, 2021). Data were collected before and after the implementation of extension interventions in village adoption. After data collection, a paired t-test was used to analyse the data.

During the baseline survey, 203 representative soil samples were collected and analysed to test the available nutrients and other soil properties. The Subbaiah & Asija method, Olsen's method, and the Neutral Normal Ammonium Acetate method were used to estimate Nitrogen, Phosphorus and Potassium, respectively in the soil. To assess the availability of Organic carbon in the soil and the availability of micronutrients like Zn, Cu, Mn, and Fe, the Walkley and Black method and the Diethylenetriamine Penta acetic acid (DTPA) method were used respectively.

Table 1. Average crop nutrient management in (kg /acre) by the farmers during baseline survey (n=30)

Sl.No	CROP	UREA	DAP	MOP	20-20
1.	COTTON	173.68	78.95	89.47	26.32
2.	PADDY	112.50	50.00	54.17	20.83
3.	MAIZE	105.56	36.11	36.11	72.22
4.	TURMERIC	42.86	64.29	89.29	64.29

Source: Baseline field survey 2018

Table 2a. Farmers' application of NPK (kg/acre) during baseline survey

Sl.No	Crop	Level of application of NPK (kg/acre)		
		N	P	K
1.	Cotton	99	41	54
2.	Paddy	65	27	33
3.	Maize	70	31	22
4.	Turmeric	45	43	54

Source: Authors' calculation 2018

Table 2b. Recommended application of NPK (kg/acre)

Sl.No	Crop	Level of application of NPK (kg/acre)		
		N	P	K
1.	Cotton	45-50	24	24
2.	Paddy	40-45	20	16
3.	Maize	72-80	24	20
4.	Turmeric	60	30	90

Source: Telangana vyvasayam diksuchi 2019.

Table 3. Crop nutrient management practices by the farmers of the adopted village during Endline survey.

(n=30)

Sl.No	Crop	Changed nutrient Management practices of NPK (kg/acre)		
		N	P	K
1.	Cotton	65	24	33
2.	Paddy	54	24	33
3.	Maize	80	24	22
4.	Turmeric	80	33	50

Source: Endline survey and the Authors' calculation2020

Table 4. Extent of change in the Crop nutrient management practices N=30

S.No.	Parameter	During the baseline survey2018	Existing level 2020	Mean Difference	Standard deviation	DF		P value
1	Technical knowledge on Crop nutrient management	1.733	2.767	1.033	0.895	29	0.05	0.00
2	Advisory seeking from experts	1.367	2.267	0.900	0.854	29	0.05	0.00
3	Reduction in the cost incurred on nutrient management	1.767	2.367	0.600	0.821	29	0.05	0.02
4	Organic manure application	1.667	2.600	0.933	0.853	29	0.05	0.00
5	Recommended dosage of fertiliser	1.533	2.633	1.100	0.809	29	0.05	0.00
6	Reduction in the cost of cultivation	2.067	2.233	0.167	0.481	29	0.05	0.04
7	Yield obtained	1.700	2.300	0.600	0.781	29	0.05	0.00

Source:Endline survey 2020

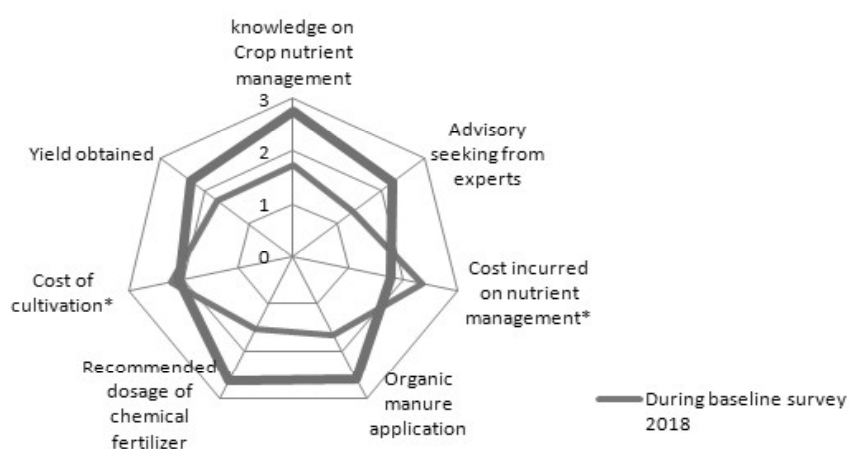


Figure 1: Changes in parameters considered for the Village adoption program
***Scores given 3,2,1 for least agree, agree, and strongly agree to resurvey during 2020**

RESULTS AND DISCUSSION

There is a noticeable difference with recommended practices of soil nutrient management practices with farmers' responses about existing soil nutrient management practices during the baseline village survey. The farmers' responses to their crop nutrient management are presented in Tables 1 and 2. Soil analysis revealed that in Seethampuram village soils are neutral to strong alkaline in reaction (pH-7.0-9.06), Non-saline to Saline in nature (Ec-0.30-2.95dS/m), and organic carbon is low to medium (0.10-0.74%).

Nitrogen is low to medium (88-339 kg/Ha). Phosphorus and potassium are medium to very high at 37-228 kg/Ha and 297-1309 kg/Ha, respectively. The application of phosphorus and Potassium exceeded the recommendation at 30-40 per cent and 10-12 per cent, respectively.

Results presented in Tables 1 and 2 indicate a knowledge gap among farmers in crop nutrient management. Though the crop yields are on par with the average yields of the locality, the expenditure on crop nutrient management is on the higher side. Hence, various Extension interventions were implemented three years to enhance the technical knowledge of the farmers in crop nutrient management and reduce the cost of crop nutrient management.

To test the study's hypothesis, thirty farmers from the village of Seethampuram, who were interviewed during the baseline survey, were randomly chosen and re-interviewed about their existing crop nutrient management practices. Farmers' crop nutrient management practices during endline survey on various crops are presented in Table 3. The re-interview results and the extent of change are shown in Table 4.

Results presented in Table 4 revealed that there has been a significant improvement in soil quality following the application of organic manure. Farmers now understood the importance of using organic manure in their fields. A significant improvement (at a 5% level of significance) is observed among farmers in technical knowledge on Crop nutrient management, advisory-seeking behaviour, Organic manure application, following

scientific recommendations, and yield obtained. Sustained extension support and continuous monitoring during the village adoption period were instrumental in addressing knowledge gaps and fostering advisory-seeking behaviour among farmers (Rao KN, Reddy SV, 2022). Farmers opined that a reduction in fertiliser management and cost incurred to raise the crop would be beneficial. The evaluation of the Village Adoption Programme demonstrated significant positive shifts in farmer behaviour, including increased use of organic manure and adherence to recommended fertiliser dosages, which collectively improved productivity (Patil SS, Pawar RS, 2023).

CONCLUSION

The village adoption programme is one of the most effective extension approaches for imparting technical knowledge to farmers and empowering them with the latest agricultural technology. Regular assessment and feedback mechanisms embedded in the extension programmes have ensured not only increased adoption but also sustained improvements in farm management practices (Sharma R, Mehta V, 2021). Farmers realised that there is no yield difference if they reduce dosage of fertiliser application from their actual practices to recommended crop nutrient management practices advised through this village adoption programme. Similar improvements in sustainability and yield stability were observed in recent Village Adoption Programme assessments conducted in Karnataka, demonstrating that participatory learning and continuous technical backstopping effectively empower farmers to make evidence-based nutrient decisions (Darshan ME, Govinda Gowda V, Shivappa Nayaka HB, Satisha HS, 2025). Effective programme evaluation through baseline and endline surveys, combined with participatory farmer feedback, plays a critical role in ensuring the ongoing relevance and impact of Village Adoption Programmes as sustainable extension strategies (Remya M, 2015).

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