



Impact of Rythu Bharosa Kendra's as Perceived by the Farmers

N. Nagendra Babu ^{a++*}, M. Venkataramulu ^{a++},
H. D. Venu Prasad ^{a++}, A. S. R. Sarma ^{a#} and M. Usha ^{a++}

^a District Agricultural Advisory and Transfer of Technology Centre, Eluru-534 006, Eluru District, Acharya N. G. Ranga Agricultural University, Guntur- 522034, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2023/v41i92082

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/103467>

Original Research Article

Received: 10/05/2023
Accepted: 19/07/2023
Published: 25/07/2023

ABSTRACT

Rythu Barosa Kendras (RBKs) in Andhra Pradesh aim to support farmers by providing various services and resources. Their impact on farmers' perception and utilisation has become crucial for the agricultural landscape. This study investigates the RBK services' impact using non-parametric statistical methods. The services of the RBK's were finalised using face validity and multi-stage sampling techniques were employed to select a representative sample of 60 farmers. Results indicate that variables like caste and annual income were significant at 1 % whereas education, occupation, land holding and the source of information was significant at 5 %, influencing the perception of services. However, none of the variables under study affect service utilisation. Identified constraints include non-availability of seeds, fertilizers, green manure, fodder crop seeds, and micronutrients at RBK. Lack of credit-based input supply, farm machinery, equipment, tarpaulin, and cold storage/godowns, along with insufficient staff and marketing facilities, also hinder performance. The study highlights the valuable role of AEOs in shaping farmers' perceptions about agricultural services through the provision of information and knowledge. However, this perception did not directly lead to increased service utilization. Policymakers and stakeholders in the agricultural sector should focus on strengthening the AEOs' role and improving the accessibility of agricultural services to enhance productivity and development in the State.

⁺⁺ Agril. Extension;

[#] Entomology;

*Corresponding author: E-mail: n.nagendrababu@angrau.ac.in;

Keywords: Rythu Bharosa Kendra; Utilisation; perception; constraints; chi-square test.

1. INTRODUCTION

Rythu Bharosa Kendra, also known as RBK, is an agricultural support system implemented in the Indian state of Andhra Pradesh. Introduced by the state government, Rythu Bharosa Kendra aims to provide comprehensive assistance to farmers, covering various aspects of agriculture and rural development. The term "Rythu Bharosa" translates to "Farmer's Trust" in the Telugu language, reflecting the program's commitment to supporting the farming community [1]. The establishment of Rythu Bharosa Kendra centers across the state signifies the government's dedication to empowering farmers and improving their livelihoods. Andhra Pradesh is being an agrarian state. The government of Andhra Pradesh focuses more on the welfare of the farming community by providing hassle-free services at the village level [2]. Rythu Bharosa Kendra serves as a one-stop destination for farmers, offering a wide range of services and facilities [3]. Raghu Prasad et al. [4] analysed the Raitha Samparka Kendras in Karnataka state and based on primary data, 122 farmers were selected for field survey. These centers are equipped with modern infrastructure and trained personnel who provide farmers with essential information, technical guidance, and resources required for successful farming practices. The initiative has revolutionised the agriculture sector by meeting farmers' needs from seed to sale [5]. The aim is to enhance agricultural productivity, promote sustainable practices, and ensure the economic well-being of farmers.

Some of the key services provided at Rythu Bharosa Kendra include [3]:

- 1. Advisory Services:** Farmers can seek expert advice and guidance on crop selection, pest control, fertiliser management, and other agricultural practices. The centers provide up-to-date information on weather conditions, market trends, and government schemes relevant to agriculture.
- 2. Soil Testing:** RBK centers offer soil testing facilities, allowing farmers to assess their soil's nutrient content and fertility. This helps in determining appropriate fertilisers and amendments required for optimal crop growth.

- 3. Seed Distribution:** High-quality seeds of various crops, including hybrid and improved varieties, are made available to farmers at subsidised rates. This ensures that farmers have access to quality seeds that can improve crop yields and resilience.
- 4. Farm Equipment and Machinery:** RBK centers provide access to agricultural machinery and equipment on a rental basis, reducing the financial burden on individual farmers. This enables small and marginal farmers to adopt modern technologies and practices without incurring significant capital costs.
- 5. Training and Workshops:** The centers organise training programs and workshops to educate farmers about advanced farming techniques, water management, organic farming, and other relevant topics. This knowledge sharing helps farmers enhance their skills and stay updated with the latest agricultural practices.

Rythu Bharosa Kendra plays a crucial role in strengthening the agricultural sector and empowering farmers in Andhra Pradesh. By providing comprehensive support and resources, these centers contribute to the overall development and welfare of the farming community, ensuring sustainable agricultural practices and improved livelihoods [6]. However, despite their vital role, the impact of RBK services as perceived by the farmers has not been adequately addressed. Thus, this study was conducted to examine farmers' perception and utilisation of each service offered by the RBKs while also identifying the constraints they face. By shedding light on these aspects, the research seeks to better understand the effectiveness and challenges of RBK services, ultimately contributing to their further improvement and meaningful impact on the farming community.

2. MATERIALS AND METHODS

This 2021 study utilised an Ex-post facto research design to explore the perception and utilisation of RBK services among farmers in the East Godavari district. The services offered by the RBK's were finalised from the Department of Agriculture. The services selected for the study are presented below.

Table 1. Services offered by the RBK's

S. No	Services offered by RBK's
1	RBK is providing soil & water testing facility
2	RBK is providing seed germination test facility
3	RBK is doing e-crop booking
4	RBK is providing free crop insurance/ animal insurance
5	RBK is distributing quality seed (green manure/ crop seed/fodder seed/concentrate feed)
6	RBK is distributing quality fertilizers
7	RBK is distributing quality pesticides
8	RBK is providing loan, weather and market prices information through CM APP
9	RBK is maintaining custom hiring centres
10	RBK is providing need based information to farmers on crop health management
11	RBK is maintaining digital library and information material for enhancement of farmers knowledge
12	RBK is organizing capacity building programmes to farmers in recent advances in agriculture by scientists
13	RBK is organizing polambadi/thotabadi/pasu vigyan badi
14	RBK is maintaining digital kiosk for booking inputs
15	RBK is maintaining smart TV for interaction with scientists and other experts through audio and video conferences and dissemination of technology
16	RBK is integrating with ICC, RBK channel for farmers queries and farmers-scientists interaction
17	RBK is providing free vaccination to animals, first aid for animals and treatment after consulting VAS, deworming and semen collection
18	RBK is providing animal health cards
19	RBK is giving guidance on extent of loan eligibility through bank mitra and information on government schemes
20	RBK is identifying beneficiaries for various government schemes

For each RBK service, farmers were asked to rate whether the service is perceived (perceived and not perceived), utilised (utilised and not utilised) and undecided on a 3-point continuum scale.

Constraints faced by the farmers were enquired in an open-ended questionnaire later the listed constraints that need immediate attention or intervention to improve the RBK services for farmers based on percentage analysis.

The survey focused on the district of East Godavari in Andhra Pradesh, specifically chosen due to its high number of RBKs within the Godavari zone. Among the 64 mandals in East Godavari, the study purposively selected Peddapuram, Jaggampeta, P. Gannavaram, and Amalapuram, as these mandals had the highest concentration of RBKs.

To ensure a representative sample, a multi-stage sampling process was employed. In the first stage, 12 villages were selected, with 3 villages chosen from each block. Subsequently, a simple random sampling method was used to select 5 respondents from each village, resulting in a total sample size of 60 respondents.

The collected data were organised and analysed using various statistical tools, including frequency and percentage distributions, the Chi-square test, the Mann-Whitney U test, and the Kruskal-Wallis test. These analytical methods allowed for a comprehensive examination of the data and the evaluation of patterns and associations.

Statistical tools used [7]:

Chi-square tests allow us to determine if the observed frequencies in different categories significantly deviate from the expected frequencies. This helps in understanding the influence of variables on the perception and utilisation of RBK services.

The formula for calculating the chi-square (χ^2) statistic in a chi-square test of independence is as follows:

$$\chi^2 = \sum [(O - E)^2 / E]$$

Where:

χ^2 represents the chi-square statistic,
 \sum denotes the summation symbol,
 O indicates the observed frequency in each cell of the contingency table,

E represents the expected frequency in each cell of the contingency table.

χ^2 continuity correction was performed using JASP software for those variables who didn't meet the conditions.

The Mann-Whitney U test, also known as the Wilcoxon rank-sum test, is a non-parametric statistical test used to determine if there is a significant difference between the distributions of two independent groups.

The formula for calculating the Mann-Whitney U statistic is as follows:

$$U = R - (n_1 * (n_1 + 1))/2$$

Where:

- U represents the Mann-Whitney U statistic,
- R denotes the sum of ranks for one of the groups,
- n_1 indicates the sample size of the first group.

The Kruskal-Wallis test is a non-parametric statistical test used to determine if there are significant differences between the distributions of three or more independent groups.

The formula for calculating the Kruskal-Wallis test statistic is as follows:

$$H = [(12 / (N * (N + 1))) * \sum (R_i^2 / n_i)] - 3 * (N + 1)$$

Where:

- H represents the Kruskal-Wallis test statistic,
- N denotes the total number of observations across all groups,
- R_i indicates the sum of ranks for group i,
- n_i represents the sample size of group i.

3. RESULTS AND DISCUSSION

3.1 Demographic Profile of the Respondents

The Table 2 revealed that the middle-age group had the highest representation (53%) among respondents. Most respondents achieved high

school education (33%), and farming was the primary occupation for the majority (95%). Backward Caste (BC) respondents constituted the largest group (63%), followed by Other Caste (OC) (22%) and Scheduled Caste (SC) (15%). Respondents with farming experience ranging from 21 to 30 years formed the largest group (43%), and those with over 30 years of experience accounted for 27%. The majority of respondents had landholdings under 5 acres (52%) and an annual income of 50,000 to 1,00,000 (40%). Most respondents had family sizes of up to 5 members (92%), mostly from nucleus families (83%). Only 30% were members of social organizations. In terms of extension contact, sometimes (50%) was the most common, followed by frequent (38%) and rare (12%) contact. MPEOs/VAAAs were the most accepted sources of agriculture -related information (28%), while AEO (5%), ADA (8%), and Scientists (7%) had the lowest participation. The above findings are in line with the findings of Olaniyi and Adewale [8], Francis [9], Panda et al. (2019) and Sarnaik et al. [10].

3.2 Perception and Utilisation

From the above table it is evident that all respondents perceived the e-crop booking facility, free crop insurance/animal insurance, and identifying beneficiaries for various government schemes. The findings are accordance with the study reported by Salam and Khan [11], Somanje et al. [12] and Saifuddin et al. [7]. The facilities that were utilised by a significant proportion of respondents was mentioned in the figure. This trend was also witnessed by Chowdary et al. [3].

It is important to note that while certain facilities were widely perceived, the utilisation rates varied. The facilities with the highest utilisation rates included e-crop booking, identifying beneficiaries for various government schemes, free crop insurance/animal insurance. These conclusions highlight the importance of promoting and facilitating the utilisation of various agricultural facilities and services among farmers, as well as the need to address any barriers that may hinder the utilisation of perceived facilities.

Table 2. Demographic profile of the respondents

S .No.	Variable	Frequency	Percentage
Age			
1	<35 yrs (Young)	9	15.0
2	36-54 yrs (Middle)	32	53.3
3	> 55yrs (Old)	19	31.7
Education			
1	Illiterate	8	13.3
2	Primary	18	30.0
3	Highschool	20	33.3
4	Inter/polytechnic	7	11.7
5	UG	7	11.7
Occupation			
1	Farming	50	95
2	Farming+Business	10	5
Caste			
1	SC	9	15
2	BC	38	63.3
3	OC	13	21.7
Farm experience			
1	<10	3	5
2	20-30	15	25
3	21-30	26	43.3
4	>30	16	26.7
Land Holding			
1	<5	31	51.7
2	5 to 10	16	26.6
3	> 10	13	21.7
Annual Income			
1	<50,000	19	31.7
2	50,000 to 1,00,000	24	40
3	> 1,00,000	17	28.3
Family size			
1	Up to 5 members	55	91.7
2	>5 members	5	8.3
Family type			
1	Joint	10	16.7
2	Nucleus	50	83.3
Social participation			
1	No Membership	42	70
2	Membership	18	30
Extension contacts			
1	Frequently	23	38.3
2	Some times	30	50
3	Rarely	7	11.7
Source of Information			
1	Scientists	4	6.7
2	ADA	5	8.3
3	AO	8	13.3
4	AEO	3	5.0
5	MPEOs/VAAAs	17	28.3
6	Farmers/others	9	15.0
7	Input dealers	14	23.4

Note: SC- Scheduled Caste, BC- Backward Caste, OC- Open Caste, Poly- Polytechnic, UG- Under Graduate
 ADA- Assitant Director of Agriculture, AO- Agriculture Officer, Agricultural Extension Officer (AEO),
 MPEOs-Multi purpose Extension Officer, VAAAs-Village Agricultural Assistants

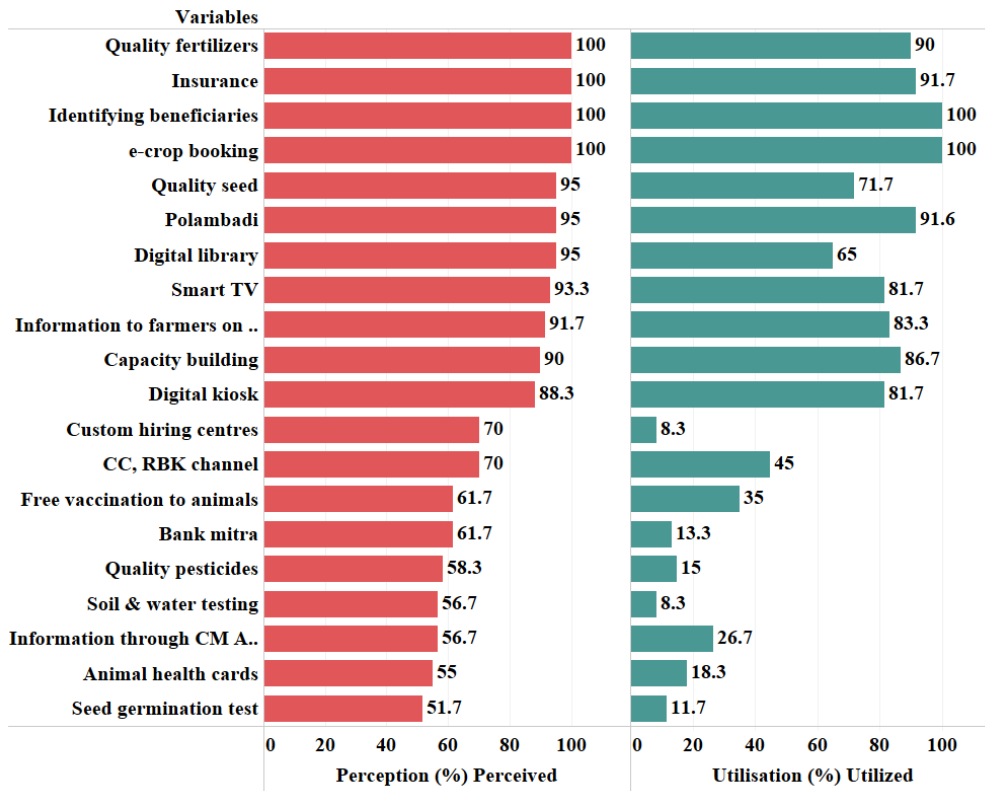


Fig. 1. Percentage of farmers perceived and utilised the services of RBK's

3.3 Chi-square Test Results

Table 3. Association between independent variables and Perception score

Variables	Perception			Chi square value	P value
	Low	Medium	High		
Age					
Young	1	2	6	6.98 ^{NS}	0.136
Middle	11	10	11		
Old	3	3	13		
Education					
Illiterate	0	1	7	17.33 ^{**}	0.027
Primary	6	1	11		
Highschool	5	7	8		
Inter/poly	3	4	0		
UG	1	2	4		
Occupation					
Farming	14	9	27	7.92 ^{**}	0.019
Farming+Business	1	6	3		
Caste					
SC	1	1	7	19.5 ^{***}	0.001
BC	5	12	21		
OC	9	2	2		
Farm Experience					
<10	0	2	1	5.20 ^{NS}	0.518
20-30	4	2	9		
21-30	8	7	11		

Variables	Perception			Chi square value	P value
>30	3	4	9		
Land holding				10.38**	0.034
<5	3	7	21		
5 to 10	7	4	5		
> 10	5	4	4		
Annual Income				13.83***	0.008
<50,000	1	5	19		
50,000 to 1,00,000	7	5	5		
> 1,00,000	7	5	6		
Source of Information					
Scientists	1	0	3		0.050
ADA	1	2	2		
AO	4	4	0		
AEO	0	0	3	21.05**	
MPEOs/VAAAs	6	4	7		
Farmers/others	1	0	8		
Input dealers	2	5	7		
Family Size					0.375
Up to 5 members	15	13	27	1.96 ^{NS}	
>5 members	0	2	3		
Family type					0.887
Joint	3	2	5	0.24 ^{NS}	
Nucleus	12	13	25		
Social participation				2.69 ^{NS}	0.259
No Membership	11	8	3		
Membership	4	7	7		
Extension contact				5.60 ^{NS}	0.230
Frequently	4	0	3		
Some times	7	8	15		
Rarely	4	7	12		

Table 4. Association between independent variables and Utilisation score

Variables	Utilisation			Chi square value	P value
	Low	Medium	High		
Age				3.49 ^{NS}	0.478
Young	1	2	6		
Middle	10	9	13		
Old	8	4	7		
Education				6.30 ^{NS}	0.613
Illiterate	3	1	4		
Primary	5	6	7		
Highschool	5	7	8		
Inter/poly	4	0	3		
UG	2	1	4		
Occupation				1.40 ^{NS}	0.495
Farming	17	13	20		
Farming+Business	2	2	6		
Caste					
SC	4	2	3		0.435
BC	10	12	16	3.79 ^{NS}	
OC	5	1	7		
Farm Experience					0.999
<10	1	1	1		

Variables	Utilisation			Chi square value	P value
20-30	5	3	7	0.41 ^{NS}	
21-30	8	7	11		
>30	5	4	7		
Land holding				1.85 ^{NS}	0.763
<5	8	8	15		
5 to 10	7	4	5		
> 10	4	3	6		
Annual Income				5.90 ^{NS}	0.206
<50,000	5	7	13		
50,000 to 1,00,000	9	4	4		
> 1,00,000	5	4	9		
Source of Information				9.16 ^{NS}	0.689
Scientists	1	1	2		
ADA	3	0	2		
AO	2	4	2		
AEO	0	1	2		
MPEOs/VAAAs	4	4	9		
Farmers/others	3	3	3		
Input dealers	6	2	6		
Family Size				2.56 ^{NS}	0.277
Up to 5 members	19	13	23		
>5 members	0	2	3		
Family type				0.41 ^{NS}	0.813
Joint	4	2	4		
Nucleus	15	13	22		
Social participation				1.00 ^{NS}	0.606
No Membership	13	12	17		
Membership	6	3	9		
Extension contacts				0.80 ^{NS}	0.937
Frequently	2	1	4		
Some times	10	8	12		
Rarely	7	6	10		

Table 5. Results of Kruskal-Wallis test with respect to perception

Variables	Category	Mean score	Test statistic	P value
Caste	SC	38.83	14.22***	0.001
	BC	33.46		
	OC	16.08		
Annual Income	<50,000	39.50	13.53***	0.001
	50,000 to 1,00,000	23.44		
	> 1,00,000	24.67		
Source of Information	Scientists	36.13	15.21**	0.019
	ADA	29.00		
	AO	15.50		
	AEO	45.50		
	MPEOs/VAAAs	26.97		
	Farmers/others	41.33		
	Input dealers	32.11		

Note: SC- Scheduled Caste, BC- Backward Caste, OC- Open Caste
 ADA- Assitant Director of Agriculture, AO- Agriculture Officer, Agricultural Extension Officer (AEO),
 MPEOs-Multi purpose Extension Officer, VAAAs-Village Agricultural Assistants

Table 6. Constraints faced by the farmers in reach of RBK services

S. No.	Constraints	Yes		No	
		Frequency	%	Frequency	%
1	Non-availability of seeds and fertilisers on time	60	100	0	0
2	Non-availability of green manure & fodder crop seeds	60	100	0	0
3	Non-availability of micronutrients at RBK	60	100	0	0
4	Inputs are not provided on credit basis	60	100	0	0
5	Non-supply of farm machinery/implements/equipment/tarpaulin	60	100	0	0
6	No cold storages/godowns for storage of inputs/produce	60	100	0	0
7	No marketing facilities both for agriculture and horticulture crops at RBK level	60	100	0	0
8	Insufficient staff at RBK	60	100	0	0
9	Non availability of pesticides at RBK	56	93	4	7
10	Non availability of information on crop loan eligibility from bank mitra/representative at RBK	55	92	5	8
11	Disrupts faced by the farmers in selling of produce at Paddy Procurement Centres (PPC) at RBKs and late payments for the marketed product	50	83	10	17
12	Insufficient infrastructure facility at RBK	52	87	8	13
13	Problems faced both in issue of cards from RBK and use of Crop Cultivator Rights Cards (CCRC) by tenant farmers with crop owner	48	80	12	20
14	No training programmes on organic farming	45	75	15	25
15	Not aware on RBK services	41	68	19	32
16	Non availability of cattle feed, non-issue of animal health cards and milk collection centres at RBKs	10	17	50	83

The chi-square analysis found that variables such as caste and annual income exhibited a high level of significance at a 1% level. Additionally, education, occupation, land holding and the source of information was found to be significant at a 5% level of significance. These results strongly suggest that these variables significantly influenced the perception of services provided by RBK's.

Upon analysing the data, it is evident that none of the variables demonstrated a significant association with the utilisation of services provided by RBK's. The data suggests that the variables examined did not have a substantial impact on the utilisation of RBK's services.

The findings revealed a distinct pattern, indicating that the SC category had the highest mean score (38.83) in terms of perception of

RBK's services, surpassing both the BC and OC categories. This implies that individuals in the SC category had a stronger perception of RBK's services compared to those in the BC and OC categories. The perception of RBK's services was found to be higher among individuals with an annual income of less than Rs. 50,000/-, followed by those with an annual income of more than Rs. 1 lakh. It was identified that Agricultural Extension Officers (AEOs) served as the primary source of information for farmers, followed by neighbours. All the variables exhibited significant difference with respect to perception of RBK services.

Farmers in the survey consistently highlighted various challenges regarding input availability, infrastructure and facilities, information and support, transactional issues, tenant farmers' rights, and constraints related to animal husbandry. The availability of essential inputs

such as seeds, fertilisers, green manure, micro nutrients, and pesticides was reported as a major obstacle by all surveyed farmers. Issues concerning infrastructure and facilities, including the need for cold storages/godowns, farm machinery/implements/equipment, marketing facilities, and sufficient staff at RBKs, were prominent concerns. Farmers expressed a lack of access to information regarding crop loan eligibility, training programs on organic farming, and awareness of RBK services. Transactional challenges, such as credit-based inputs and disruptions in selling produce at Paddy Procurement Centres (PPC), were reported by a significant percentage of farmers. The survey also highlighted problems faced by tenant farmers regarding the issue and use of Crop Cultivator Rights Cards (CCRC) with crop owners. Additionally, while not as prevalent, constraints related to animal husbandry, including the non-availability of cattle feed, animal health cards, and milk collection centers at RBKs, were mentioned as challenges. These findings indicate the need for urgent attention and action to address these constraints and provide better support to farmers. The above findings are in conformity with the findings of Chowdary et al. [3] and Saifuddin et al. [7], [10].

4. CONCLUSION

The present study looked into the perception and utilisation of the services offered by the RBKs in Andhra Pradesh from farmer's point of view using non-parametric statistical analysis. It was evident that those belong to SC category and those with an annual income of less than Rs. 50,000/- have shown a higher perception of RBK's services, efforts can be focused on reaching out to and catering to the specific needs and preferences of this target group. It was identified that Agricultural Extension Officers (AEOs) played a significant role as the major source of information for farmers. Recognising the significant influence of AEOs as a source of information, it is crucial to enhance their training, support, and resources. This can enable them to effectively disseminate information about RBK's services to farmers and address any queries or concerns they may have. In addition to this, addressing the challenges related to the availability of inputs, improving infrastructure and facilities, providing comprehensive information and support to farmers, resolving transactional issues, ensuring tenant farmers' rights, and addressing constraints in animal husbandry,

RBKs can better serve farmers and enhance their overall agricultural productivity and livelihoods.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Gibbons JD, Chakraborti S. Nonparametric Statistical Inference (5th Edition). CRC Press; 2010.
2. Reddy DA. RBKs of Andhra Pradesh—one stop solution for the needs of farming community. *Vigyan VARTA*. 2020;48(51): 22.
3. Chowdary KR, Jyotsna MK, Srisailam, Jyothi I. A Study on Perception and Utilisation of Services of Rythu Bharosa Kendra's (RBKs) by the Farmers in Chittoor District of Andhra Pradesh, India. *Current Journal of Applied Science and Technology*. 2022;41(27): 40-47.
4. Raghuprasad KP, Akarsha BM, Raghavendra K. Raitha Samparka Kendras and their role in agro-information delivery. *Karnataka Journal of Agricultural Sciences*. 2012;25(1).
5. Anuhya P, Kisku U, Khare NK. A study on correlates of profile characteristics and adoption behaviour of Rythu Bharosa Kendra (RBK) beneficiaries in Anantapur District, Andhra Pradesh. *Curr J Appl Sci Technol*. 2022;41(24): 39-45.
6. Chandan KP, Shashikant D, Anil P, Chandrashekhar A, Shashank T. Smallholder Farmers' Perception on Mobile Phone Advisory Potential in Farming in Bhagalpur, India. *Current Journal of Applied Science and Technology*. 2019;38(6):01-08.
7. Saifuddin, Md, Devy MR, Rao MS, Suseela K. Effectiveness of Rythu Bharosa Kendras (RBKs) Services as Perceived by Farmers in the East Godavari District of Andhra Pradesh, India. *Asian Journal of Agricultural Extension, Economics and Sociology*. 2023;41(4): 34-41.
8. Olaniyi OA, Adewale JG. Women Farmers' Perception and Utilisation of Marketing Information on Cassava in Osun State,

- Nigeria. Journal of Agricultural Extension. 2014;18(1):23-33.
9. Francis YA. Farmers Perceptions and Attitudes Towards the Use of Agricultural Indigenous Knowledge in Farming. Journal of Agriculture and Crops. 2018; 4(6):63-67.
 10. Sarnaik SD, Bhopale PP, Mankar DM, Tekale VS. Perception of Farmers towards Effectiveness of Extension Services of KVK. Indian Journal of Extension Education. 2020;56(4):43-48.
 11. Salam A, Khan MZ. Farmers' perception analysis about the use of information and communication technologies (ICT) in agriculture extension services of Khyber Pakhtunkhwa. Sarhad Journal of Agriculture. 2020;36(3):754-760.
 12. Somanje AN, Mohan G, Saito O. Evaluating farmers' perception toward the effectiveness of agricultural extension services in Ghana and Zambia. Indian Journal of Extension Education. 2021;10 (53):01-16.

© 2023 Babu et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/103467>