



## Farmers Information Landscape: Trends and Transformation

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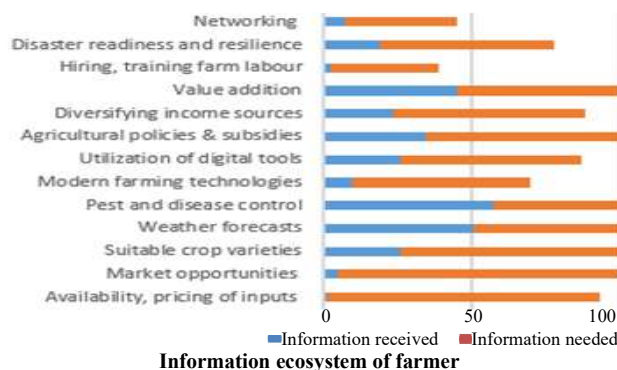
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### HIGHLIGHTS

- The research shed light on information ecosystem patterns concerning farmers.
- The potential information gaps were navigated by comparing the areas in which the contemporary extensionists were disseminating the information with the areas in which the farmers wants the information.
- This study acts as a guiding compass, steering the complexities of information distribution in agriculture.

### GRAPHICAL ABSTRACT



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### ABSTRACT

**Context:** Providing farmers with access to relevant and timely information is crucial for improving agricultural productivity, sustainability and overall well-being. Understanding the specific information needs of individual farmers and farming communities allows extension workers to tailor their advice and support. The needs of the farmers are changing with the time as they are influenced by various factors namely technological advancements, climate change, market dynamics and sustainability concerns.

**Objective:** The study aimed to navigate the potential information gaps by comparing the areas in which the contemporary extensionists are disseminating the information with the areas in which the farmers wants the information.

**Method:** A study was conducted during 2022-23 in Bapatla District, Andhra Pradesh using ex-post facto research design. A sample of 150 farmers were selected from the five villages in the district. The profile characteristics namely age, education, land holding, information sources, access to technology, mode of agricultural information receiving preference was studied. The difference between the information received by the farmers and the actual information needed by the farmer was calculated to know the information gap. Data was collected using semi-structured interview schedule.

**Results & Discussion:** The results of the study indicated significant information gaps in the aspects of information on availability and pricing of inputs at various locations (90.00%), market opportunities and potential markets (88.67%), guidance regarding suitable crop varieties (58.00%), timely and accurate weather forecasts, including extreme weather alerts (48.00%), modern farming technologies like drones & automated machinery (49.33%), changing agricultural policies & subsidies (53.33%), etc. Farmers information requirements should be the cornerstone for delivering pertinent information. Closing these information gaps may involve targeted efforts such as improved communication channels, educational programs, technological advancements and policy interventions to bridge the divide between desired and received information in these areas.

**Significance:** The study highlights the potential to leverage multimedia tools, specifically smart phones, to deliver precise information to individual farmers at the right moment.

In an age propelled by digital innovation and rapid globalization, the agricultural sector stands at a crucial crossroads where information becomes the pivot point for growth, sustainability and empowerment. The accessibility and relevance of information have become crucial, dictating the resilience and progress of farming practices while significantly impacting the socio-economic landscape of agricultural communities (Sharma, 2022). As technology continues to advance and global interconnectedness deepens, the ways in which information is sourced, distributed and utilized by farmers have undergone transformative shifts. Historically, the concept of extension services in agriculture was primarily focused on transmitting information and technological advancements developed in laboratories and research institutions to the farming communities. The primary aim was to enhance food grain production and agricultural yields. Consequently, extensionists largely concentrated on disseminating information and technologies that could directly boost production levels. Over time, these efforts have resulted in a substantial increase in food grain production, leading to achieve self-sufficiency in food. However, this success has brought new challenges to the forefront. With the increased production, the focus now needs to shift from solely emphasizing production-oriented aspects to addressing other critical factors in the agricultural ecosystem. One of these key areas is marketing the agricultural produce effectively. While the focus was primarily on increasing production, attention to marketing strategies, distribution channels, and creating opportunities for farmers to access markets efficiently becomes crucial. The Inter-Ministerial Committee on Doubling Farmers' Income (DFI) recognised agriculture as a value led enterprise and suggested empowering farmers with "improved market linkages". (*Report of the Committee on Doubling Farmers' Income Volume XIV, 2018*). Effective marketing ensures that the surplus produce reaches consumers, thus benefiting both farmers and consumers alike. Additionally, the changing climate poses a significant challenge to agriculture. Climate change brings about adverse effects such as irregular weather patterns, unpredictable rainfall, extreme temperatures and the increased incidence of pests and diseases. Farmers now need to adapt and find ways to mitigate these

adverse impacts. This includes adopting climate-resilient agricultural practices, utilizing innovative technologies, and implementing strategies to conserve natural resources. In simpler terms, the current focus of agricultural extension services needs to shift towards post-production aspects, including marketing strategies, value addition, storage and transportation infrastructure, to ensure that farmers can efficiently get their produce to market and receive fair prices. Furthermore, efforts should concentrate on equipping farmers with information and tools to cope with the challenges posed by changing climatic conditions, making their farming practices more resilient and sustainable in the face of these adversities. At this juncture, a study was conducted by comparing the information received by farmers from various sources and the actual information needed by the farmer to make farming profitable and thus the information gaps as perceived by the farmers was documented in the study.

## METHODOLOGY

The study was conducted at Bapatla District of Andhra Pradesh from the place as depicted in Fig.1. The study area is located at an altitude of 8 mts from the coast of Bay of Bengal. As the incidents has already occurred, an *ex-post facto* research design was used for the study. Five villages namely Appikatla, Nallamothuvaripalem, Narsayapalem, CJ Palem and Kankatapalem were selected purposively as farmers here cultivated crops round the year. A sample of 150 farmers cultivating three crops in a year were selected using simple random sampling procedure. All the farmers cultivated paddy in *kharif*, pulses black gram or green gram in *rabi* and vegetables in summer. The profile characteristics namely age, education, land holding, information sources, access to technology, mode of agricultural information receiving preference was studied. The difference between the information received by the farmers and the actual information needed by the farmer was calculated to know the information gap. Data was collected using semi-structured interview schedule method during 2022-23. Frequency and percentages were calculated. In addition to the above, Garret ranks were calculated for the actual information needed by the farmers. For this purpose, the respondents were asked to assign the rank for each item. Based on the ranks obtained percent position was estimated.

$$\text{Percent Position} = \frac{R_{ij} - 0.5}{N_j} \times 100$$

Where,

$R_{ij}$  = Rank given to the  $i^{\text{th}}$  variable by the  $j^{\text{th}}$  respondent

$N_j$  = Number of variables ranked by the  $j^{\text{th}}$  respondent

With the help of Garret's table, the percent position estimated was converted into scores using the table given by Garret and Woodworth (1969) and followed by Jyothi and Venkata Subbaiah (2019). as in Table 1. Then for each message, the scores of each respondent were added and then total Garret value was arrived. Based on the highest total Garret value, ranks were assigned to the items of the actual information needed.

**Table 1. Percent position and Garret value**

Percent position	Calculated value	Garret value
100(1-0.5)/9	5.51	81
100(2-0.5)/9	16.66	69
100(3-0.5)/9	27.62	62
100(4-0.5)/9	38.00	56
100(5-0.5)/9	50.00	50
100(6-0.5)/9	61.14	44
100(7-0.5)/9	72.22	38
100(8-0.5)/9	83.33	31
100(9-0.5)/9	94.44	19



**Fig. 1. Map depicting the study area**

For the purpose of the study the null hypothesis formulated was that there is no significant difference between the information received by the farmers and the actual information needed by the farmer. Alternate hypotheses framed was that there is a significant difference between the information received by the farmers and the actual information needed by the farmer.

## RESULTS

The data on the profile characteristics of farmers presented in Table 2 revealed that more than one third of the farmers were in the age group of 50-65 years (36.00%), followed by 36-50 years (32.67%) and below 35 years (31.33%). The findings revealed that the sample consisted of all the age groups young, middle and old age.

The results of the education of the farmers revealed that 41.33 per cent possessed secondary education, followed by primary schooling (24.67%), plus 2 (20.67%), graduates (11.33%) and illiterate (2.00%).

More than one third of the farmers were categorized as small farmers with land holding of 1 Ha

**Table 2. Distribution of farmers based on their profile characteristics (N=150)**

Category	No	%
<i>Age</i>		
Below 35 years	47	31.33
36-50 years	49	32.67
50-65 years	54	36.00
<i>Education</i>		
Illiterate	3	2.00
Primary school	37	24.67
Secondary school	62	41.33
Plus 2	31	20.67
Graduate	17	11.33
<i>Land holding</i>		
Upto 1 Ha	73	48.67
1 Ha to 2.5 Ha	54	36.00
2.5 Ha to 5 Ha	23	15.33
<i>Agriculture information sources</i>		
Extension personnel	137	91.33
Input dealers	17	11.33
Internet	54	36.00
Social media	79	52.67
Traditional media (TV & Newspaper)	37	24.67
Friends & relatives	49	32.67
<i>Access to technology</i>		
Smart phone	135	90.00
Internet connectivity	121	80.67
Agriculture apps in agriculture	32	21.33
<i>Mode of info. receiving preference</i>		
Directly from extension personnel	127	84.67
Traditional media (TV & Newspaper)	58	38.67
Mobile text messages	125	83.33
Mobile video messages	123	82.00
Mobile audio messages	79	52.67
Printed information materials	42	28.00

to 2.5 Ha (36.00%), followed by marginal land holding of upto 1 Ha (48.67%) and large land holding of 2.5 Ha to 5 Ha (15.33%). The results are in conformity with that reported by Vijayabhinandana et al. (2018).

Great majority of the farmers receive information related to agriculture from extension personnel (91.33%), followed by social media (52.67%), internet (36.00%), friends & relatives (32.67%), traditional media (TV & Newspaper) (24.67%) and input dealers (11.33%). The results are in conformity with that reported by Kishor Kumar et al. (2019).

Great majority of the farmers have access to smart phones (90.00%) while 80.67 per cent have access to internet and 21.33 per cent access mobile apps in agriculture. The results are in conformity with that reported by Kumar (2023.)

Data on the mode of information receiving preference of the farmers revealed that majority of them choice is to receive information Directly from extension personnel (84.67%), followed by Mobile text messages (83.33%), Mobile video messages (82.00%), Mobile audio messages (52.67%), Traditional media (TV & Newspaper) (38.67%) and Printed information materials (28.00%). The results are in conformity with that reported by Suresh et al. (2011).

The results on the farmers perceived information gaps are presented in Table 3 and Fig 2. The results revealed that a very meagre proportion (1.33%) of the farmers said that they received the information related to the availability and pricing of inputs at various locations, while 91.33 per cent of the respondents

are in need of this information. Information gap recorded was 90.00 per cent. This information need is ranked I. Only 5.33 per cent of the farmers said that they received the information related to the market opportunities and potential markets, while 94.00 per cent of the respondents are in need of this information. Information gap recorded was 88.67 per cent. This information need is ranked II. More than one fourth (26.00%) of the farmers said that they received the information on guidance regarding suitable crop varieties, while 84.00 per cent of the respondents are in need of this information. Information gap recorded was 58.00 per cent. This information need is ranked IV. The results are in conformity with that reported by Venkata Subbaiah and Jyothi (2020).

Half (50.67%) of the farmers said that they received the information on guidance regarding suitable crop varieties, while 98.67 per cent of the respondents need this information. Information gap recorded was 48.00%. This information need is ranked III. More than half (57.33%) of the farmers said that they received the information on current and effective methods for pest and disease control, while 81.33 per cent of the respondents are in need of this information. Information gap recorded was 24.00 per cent. This information need is ranked V. Only 10.00 per cent of the farmers said that they received the information on modern farming technologies like drones & automated machinery, while 59.33 per cent of the respondents are in need of this information. Information gap recorded was 49.33 per cent. This information need is ranked

**Table 3. Distribution of farmers based on their perceived information gaps**

Category	Information received		Actual Information needed		Garret Rank	Information gap	
	No	%	No	%		No	%
Availability and pricing of inputs at various locations	2	1.33	137	91.33	I	135	90.00
Market opportunities and potential markets	8	5.33	141	94.00	II	133	88.67
Guidance regarding suitable crop varieties	39	26.00	126	84.00	IV	87	58.00
Timely and accurate weather forecasts, including extreme weather alerts	76	50.67	148	98.67	III	72	48.00
Current and effective methods for pest and disease control	86	57.33	122	81.33	V	36	24.00
Modern farming technologies like drones & automated machinery	15	10.00	89	59.33	VI	74	49.33
Utilization of digital tools for farm management	39	26.00	91	60.67	IX	52	34.67
Changing agricultural policies & subsidies	52	34.67	132	88.00	VIII	80	53.33
Diversifying income sources in agriculture	35	23.33	97	64.67	VII	62	41.33
Value addition to agricultural products	67	44.67	83	55.33		16	10.67
Hiring and training farm labour	4	2.67	54	36.00		50	33.33
Strategies for disaster readiness and resilience	29	19.33	87	58.00		58	38.67
Networking with fellow farmers and agricultural organizations	11	7.33	56	37.33		45	30.00

VI. The results are in conformity with that reported by *Jyothi et al. (2020)*.

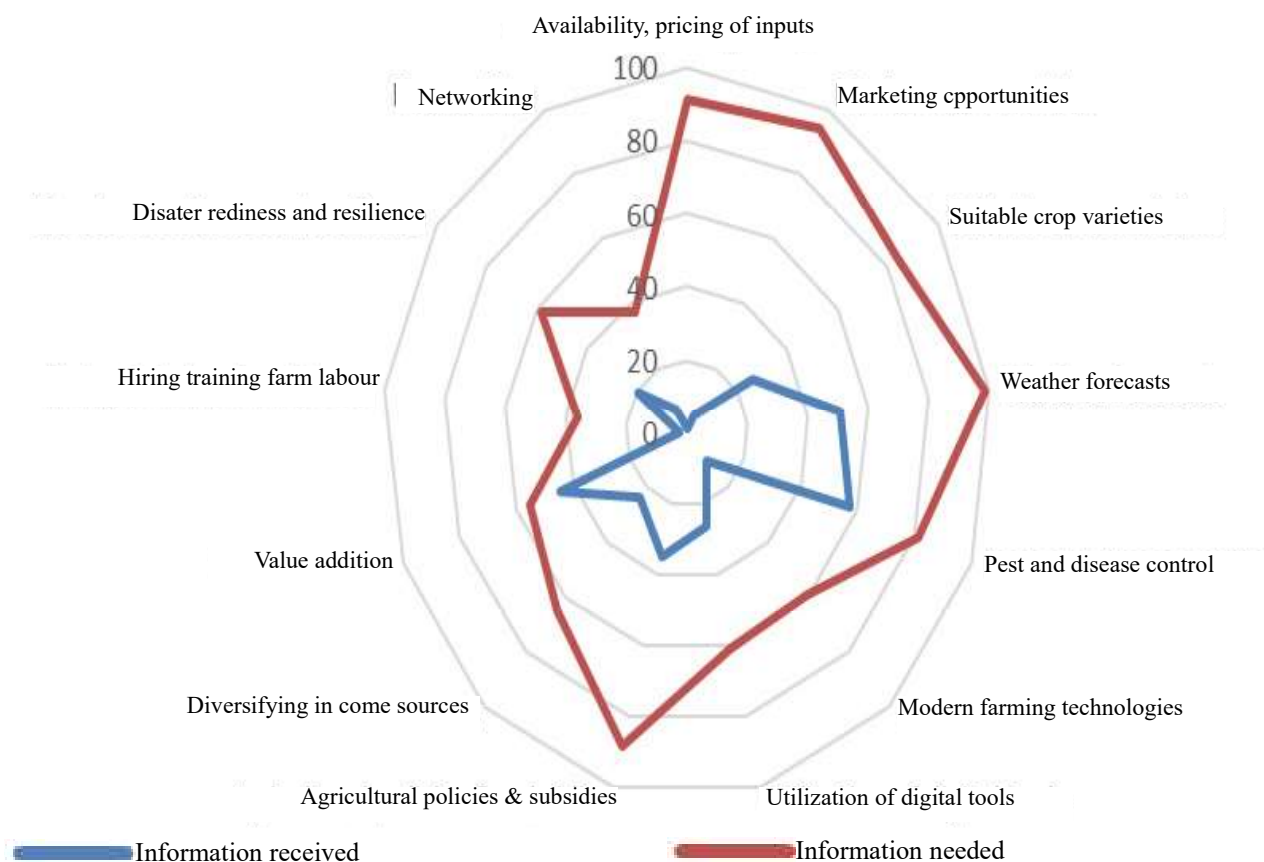
More than one fourth (26.00%) of the farmers said that they received the information on utilization of digital tools for farm management, while 60.67 per cent of the respondents are in need of this information. Information gap recorded was 34.67 per cent. This information need is ranked IX. More than one third (34.67%) of the farmers said that they received the information on changing agricultural policies & subsidies, while 88.00 per cent of the respondents are in need of this information. Information gap recorded was 53.33%. This information need is ranked VIII. Less than one fourth (23.33%) of the farmers said that they received the information on diversifying income sources in agriculture, while 64.67 per cent of the respondents need this information. Information gap recorded was 41.33 per cent. This information need is ranked VII. Less than half (44.67%) of the farmers said that they received the information on value addition to agricultural products, while 55.33 per cent of the respondents are in need of this information. Information gap recorded was 10.67 per cent. the

results are in conformity with that reported by *Lwoga et al. (2010)*; *Bachhav (2012)*; *Madhavan (2017)* and *Chen and Lu (2020)*.

Very meager proportion (2.67%) of the farmers said that they received the information on hiring and training farm labour, while 36.00 per cent of the respondents are in need of this information. Information gap recorded was 33.33%. Less than one fourth (19.33%) of the farmers said that they received the information on strategies for disaster readiness and resilience, while 58.00 per cent of the respondents are in need of this information. Information gap recorded was 38.67 per cent. Meager proportion (7.33%) of the farmers said that they received the information on networking with fellow farmers and agricultural organizations, while 37.33 per cent of the respondents are in need of this information. Information gap recorded was 30.00 per cent. The results are in conformity with that reported by *Venkata Subbaiah et al. (2020)*.

## DISCUSSION

*Age* : The finding on age highlights a significant



**Fig. 2. Information gaps perceived by the farmers**



presence of experienced and relatively older individuals engaged in agricultural activities. The considerable proportion of middle-aged farmers represent the individuals contributing to the agricultural workforce with a balance of experience and adaptability to new technologies and modern farming practices. The findings also reveal the inclusion of younger farmers entering the agricultural domain. So, the sample consisted of farmers with diverse needs, experiences, and capabilities.

*Education:* The diversity in educational backgrounds among farmers highlights the need for tailored agricultural extension services and knowledge dissemination strategies that cater to various educational levels.

*Land holding:* The distribution of farmers across different land holding categories emphasizes the importance of acknowledging the diversity and varying needs of farmers based on their land sizes.

*Agriculture information sources:* The findings highlight the diverse channels through which farmers access agricultural information. While extension personnel stand out as the primary source because of authenticity, the significant use of social media and internet indicates a growing reliance on digital platforms for accessing up-to-date and varied agricultural knowledge. Additionally, the influence of personal networks namely friends and relatives remain notable, showcasing the importance of informal communication among farmers.

*Access to technology:* The high access to smart phones, coupled with internet accessibility and the adoption of agricultural mobile apps, signifies a promising trend in the agricultural sector's integration with technology. Understanding these statistics is pivotal in harnessing the potential of technology to empower farmers, enhance agricultural practices, and contribute to overall agricultural development and sustainability.

*Mode of information receiving preference of farmers:* The findings indicated a strong preference for direct interaction, guidance, and knowledge sharing with extension personnel who are experts in agricultural practices and technologies. These findings also reflect a significant inclination towards mobile based communication channels for receiving agricultural information. Additionally, the popularity of mobile text, video, and audio messages suggests a preference for easily accessibility. The relatively

lower preference for traditional media sources and printed materials indicates a changing trend in how farmers seek and consume information. This shift towards mobile-based communication methods emphasize the importance of leveraging technology and multimedia content to effectively disseminate agricultural knowledge and practices to a wide farming audience.

*Information gaps perceived by the farmers:* The results revealed that there is a substantial lack of information or clarity regarding where to obtain agricultural inputs and their pricing at different locations, which could significantly affect planning and budgeting. Farmers might be unaware of potential markets or opportunities, impacting their ability to maximize profits or diversify their produce. Knowledge gaps exist regarding the most appropriate crop varieties for different conditions, which might hinder optimal yield and resilience. Further the survey uncovered significant information shortfalls across diverse agricultural areas, highlighting a crucial issue that farmers aren't receiving the necessary information. Instead, there is a "push" model of information delivery, lacking alignment with farmers actual needs. It is essential to analyze farmer's information requirements, making these needs the cornerstone for delivering pertinent information. By bridging these gaps and equipping farmers with essential information and support, there is a substantial potential to boost their productivity, profitability and resilience amidst the multifaceted challenges in agriculture. Additionally, the study highlights the potential to leverage multimedia tools, specifically smart phones, to deliver precise information to individual farmers at the right moment. This approach aims to optimize the use of technology in providing timely and relevant agricultural insights to farmers.

## CONCLUSION

Addressing these gaps could be crucial for enhancing agricultural practices, decision-making and overall efficiency within the farming community. Closing these information gaps may involve targeted efforts such as improved communication channels, educational programs, technological advancements and policy interventions to bridge the divide between desired and received information in these areas. This study would serve as a compass, guiding us through the intricacies of information dissemination in agriculture. The study

would be a guide to probe the potential opportunities for stakeholders, policymakers and technology innovators to collaborate in bridging information gaps, ensuring inclusivity and harnessing the evolving information landscape for the benefit of farmers.

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#### *Declaration of competing interest:*

Authors have no competing interests.

#### *Data availability:*

Data would be made available on request

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#### *Appendix:*

The supplementary data, table, graph in jpeg format for online visibility to the readers are submitted as an appendix.

#### *Authors' contribution:*

Both the authors conceptualized and operationalized the study. The data was analyzed, interpreted and written as article by the first author. The second author edited and revised the manuscript. The authors approve of the content of the manuscript and agree to be held accountable for the work.

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