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# **Economic Empowerment Through Information** Access: A Study of Farmers in the Kumaun **Division of Uttarakhand**

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# Abstract

This research investigates the role of agricultural information access in enhancing the economic empowerment of farmers in the Kumaun region of Uttarakhand, a geographically challenging area where farming is the main livelihood. The study is based on primary data collected from 300 farmers across three districts are Nainital (low hill), Almora (mid-hill), and Bageshwar (high hill), using structured surveys, focus group discussions, and key informant interviews. It evaluates how factors like digital literacy, gender, and geography influence farmers' access to agricultural knowledge and how this access affects outcomes such as income, crop diversification, and the use of modern practices.

The results highlight that although farmers who regularly access digital or formal sources of information (such as Kisan Call Centers, Krishi Vigyan Kendras, mobile apps, etc.) show slightly higher levels of awareness and income, the overall impact on economic indicators is not statistically significant. A key finding is the consistent gender gap. Male farmers are far more likely to access and benefit from agricultural information than their female counterparts. As well, digital exclusion due to poor infrastructure, lack of localized content in native dialects like Kumaoni, and limited trust in agri-tech tools restrict the potential benefits of government and private information services.

The study also finds that altitude and digital literacy alone do not significantly affect access or outcomes, suggesting deeper systemic and cultural barriers. Farmers, even when digitally literate, often Avoid from using agricultural apps due to usability challenges, content irrelevance, or lack of training. Additionally, no strong link was observed between access to information and decisions such as crop diversification, hinting at market dependency and risk resistance as influencing factors.

This research concludes that information access alone is insufficient to drive economic transformation unless it is inclusive, context-specific, and accompanied by capacity-building interventions. It recommends the development of regionally-tailored digital content in local languages, gender-sensitive outreach strategies, infrastructure enhancement, and integrated efforts involving local governance bodies, NGOs, and agricultural institutions. Such holistic strategies are essential for building a sustainable and information-empowered agricultural ecosystem in the hilly regions of Uttarakhand.

Keywords: Economic empowerment, Information Access, decision-making power, agricultural information, Crop Diversification, Kisan Call Centers, Krishi Vigyan Kendras



### Introduction

In the contemporary knowledge-driven global economy, information is a critical resource that determines access to opportunities, decision-making power, and economic well-being. For rural communities, especially in geographically challenging and socio-economically constrained regions like the Kumaun division of Uttarakhand, access to timely and relevant information can significantly transform lives. Agriculture remains the primary livelihood for the majority of the population in this region, but traditional practices, limited exposure to market trends, and climatic vulnerabilities continue to hinder productivity and income growth.

The Kumaun region, which includes Almora, Nainital, Bageshwar, Pithoragarh, Champawat, and Udham Singh Nagar, has a diverse landscape and a diverse social structure. Udham Singh Nagar, located in the plains, has better infrastructure and easier access to resources. In contrast, the hill districts face challenges like being far from main service centers, having small and scattered farms, and receiving poor services. In this situation, having timely information about weather, crop care, pest control, government schemes, market rates, and new farming technologies is very important for helping farmers improve their agriculture and become economically stronger.

The Indian government and state agencies have launched many programs to share agricultural information with farmers. These include Kisan Call Centers (KCCs), Krishi Vigyan Kendras (KVKs), the mKisan portal, radio shows like Krishi Darshan, and mobile apps like Kisan Suvidha. However, in rural parts of Uttarakhand, especially in the hilly areas, the flow of information is still not smooth or widespread. Many farmers either don't know about these services or can't use them due to problems like poor mobile networks, lack of digital skills, language barriers, and limited access for women.

Economic empowerment of farmers is not just about increasing their income, it also means giving them the knowledge and tools to make better decisions, reduce their dependence on intermediaries, access financial services like credit and insurance, and deal more effectively with changes in the market and climate. For this kind of empowerment, it's crucial that farmers have access to the right information in a form they can understand and use. However, most studies so far have focused on agriculture in the plains of India. There is very little research that looks at hill farming, which faces different problems and needs special attention. The unique culture, geography, and poor infrastructure of hill regions like Kumaun make it necessary to have specific studies and policies tailored to their situation.

This study aims to address the existing research gap by closely examining how farmers in the Kumaun division access agricultural information, how this access impacts their economic well-being, and what challenges prevent them from fully benefiting from available resources. It also looks at how different social groups, especially women farmers, small landholders, and Scheduled Caste/Scheduled Tribe communities, interact with and are affected by the flow of information.

By conducting fieldwork and collecting real-world data, the study seeks to provide practical insights and recommend focused actions to improve the overall information environment. These efforts are intended to support sustainable rural development and promote greater economic independence for farming communities in the Himalayan region.

### **Objectives of the Study:**

- Analyze disparities in access to farming information across gender, caste, altitude.
- Identify challenges limiting effective use of information.



- Assess the impact of information access on economic indicators (crop yield, income, market linkages).
- Propose realistic, scalable, and sustainable interventions to enhance information access and economic empowerment.

### **Research Hypotheses:**

- There is no significant difference in agricultural income between farmers who regularly access information (through digital or formal sources) and those who do not.
- There is no significant disparity in access to agricultural information based on gender.
- There is no significant impact of altitude (low, mid, high hill) on the accessibility of market or weather-related information.
- There is no significant relationship between the level of digital literacy and the usage of agricultural mobile applications or platforms.
- There is no significant correlation between information access and the diversification of crops cultivated.

### **Review of Literature:**

The intersection of information access and agricultural development has been extensively explored in academic and policy discourses. Scholars have long asserted that information and communication technologies (ICTs) can bridge critical knowledge gaps and drive economic transformation in rural areas (Singh et al., 2020). These technologies empower farmers by providing timely, relevant, and actionable information on crop management, weather patterns, pest outbreaks, government subsidies, and market linkages.

### **ICTs in Agriculture: National Context**

Across India, initiatives like Digital India, Soil Health Cards, Agri-Clinics, and eNAM (National Agriculture Market) have aimed to revolutionize traditional farming practices by leveraging the power of digital tools. Mobile applications such as Kisan Suvidha, IFFCO Kisan, and mKisan Portal allow farmers to access real-time data on weather, prices, and expert advice. However, studies by Singh et al. (2020) and Sharma & Patel (2018) reveal that despite the availability of these resources, actual user adoption remains relatively low, especially among small and marginal farmers.

### **Regional Relevance: Uttarakhand**

In the specific context of Uttarakhand, the challenges are more difficult due to the hilly terrain, scattered settlements, and limited infrastructure. Pant (2019) highlights that traditional media like radio broadcasts (e.g., Krishi Darshan, Mera Gaon Mera Gaurav) still play a crucial role in information spread due to their reach in remote areas. Yet, modern ICT interventions have not achieved the desired penetration due to poor mobile network coverage, lack of electricity, and digital illiteracy. A field study by Mehta and Joshi (2021) noted that only 28% of hill farmers in districts like Pithoragarh and Bageshwar actively use mobile apps related to agriculture, despite owning smartphones.

Barriers to Information Access: Key recurring challenges identified in literature include:

• **Digital divide:** A gap exists between farmers who have access to smartphones and the internet and those who do not (Kumar & Bhatia, 2022).





- Lack of vernacular content: Most digital content is in Hindi or English, excluding many farmers who speak regional dialects like Kumaoni and Johari.
- **Infrastructure deficits:** Frequent power outages, mobile signals, and poor road connectivity hinder consistent access (Verma, 2020).
- **Socio-cultural barriers:** Gender norms, caste-based exclusions, and generational differences in technology use affect how and who accesses information.

# Need for Region-Specific Research:

Even though there is growing interest in using technology in rural areas, farming in the hill regions of Uttarakhand has not been studied enough. Most research is based on conditions in the plains, which are quite different from what farmers face in the mountains. As Rawat (2022) points out, government policies often ignore the unique environment and social structure of the Himalayan region. Because of this, many schemes do not work as well as they could.

Also, when the government reviews programs like Kisan Call Centres or Agricultural Extension Services, they usually don't separate the data based on groups like Scheduled Castes, Scheduled Tribes, women, or young people. This makes it hard to know whether these programs are helping everyone equally. That's why it's important to carry out research that is focused on the local level. Such studies should not only look at how much access farmers have to information but also how that access affects their income, crop production, and ability to deal with climate changes.

# **Research Methodology:**

The methodology adopted for this study integrates both **quantitative and qualitative approaches** to provide a comprehensive understanding of how information access affects the economic empowerment of farmers in the Kumaun region. The research design ensures depth, representation, and reliability while addressing the unique socio-geographical challenges of hill agriculture.

### **Research Design:**

This study follows a mixed-methods research design—descriptive and analytical in nature.

- The descriptive component aims to document and present the existing patterns of information access, sources of agricultural knowledge, and the level of digital literacy among farmers in the selected districts.
- The analytical component investigates the relationship between access to information and key indicators of economic empowerment, such as income levels, decision-making autonomy, market participation, and the use of modern agricultural techniques.

**Sampling Strategy:** The study uses stratified random sampling to ensure representation across different geographical, social, and economic strata.

- Sample Size: 300 farmers (100 from each district)
- Geographical Scope: Three districts of Kumaun division
- ➢ Nainital (lower hill)
- ➢ Almora (middle hill)
- Bageshwar (higher hill)

Stratification was done based on:

• Gender (male and female farmers)



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# • Landholding size (marginal, small, and medium farmers)

**Tools for Data Collection:** The study used multiple tools to ensure accurate and comprehensive data. Structured questionnaires in Hindi and English collected details on demographics, information sources, ICT usage, and economic indicators. Focus Group Discussions (FGDs) with farmers, officials, and Panchayat member's explored barriers and trust in information. Key informant interviews were also held with Krishi Vigyan Kendras (KVKs), officials, agricultural department representatives, and NGOs working on digital literacy and extension services.

# Data Analysis Techniques:

- Quantitative Data:
- Descriptive statistics: Mean, frequency, percentage, standard deviation.
- Inferential statistics:
- **t-test** and **ANOVA** (to assess disparities across groups)
- Chi-square tests (for categorical data)
- Correlation and regression (to examine relationships between access and outcomes)
- Qualitative Data:
- Thematic analysis using coding frameworks
- Narrative synthesis to identify barriers and perceived impact of information access

# **Data Analysis and Findings:**

The collected data was analyzed through a combination of statistical and thematic approaches to understand the nature and impact of information access on the economic empowerment of farmers in the Kumaun region. The findings reveal critical insights into usage patterns, information gaps, and the socio-economic effects of digital knowledge dissemination.

### Hypothesis 1: There is no significant difference in agricultural income between farmers who regularly access information and those who do not.

Group	Average Annual	Standard	t-	р-	Significance
	Income (₹)	Deviation	value	value	
Regular Info	1,28,000	25,000	1.45	0.148	Not
Access (n=114)					Significant
Limited/No Info	1,21,000	27,500			
Access (n=186)					

Hypothesis 2:

# There is no significant disparity in access to agricultural information based on gender.

Gender	<b>Regular Info Access</b>	Sample	χ <sup>2</sup> (Chi-	р-	Significance
	(%)	Size	square)	value	
Male	52%	180	21.43	< 0.01	Significant
Female	18%	120			Gender disparity
					found

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# **Hypothesis 3:**

# There is no significant impact of altitude (low, mid, high hill) on access to market/weather-related

information.

Altitude	Info	Market Info	Weather Info	F-	р-	Significance
Level	Access (%)	Access (%)	Access (%)	value	value	
Low Hill	52%	49%	46%	2.19	0.09	Not
(Nainital)						Significant
Mid Hill	36%	32%	30%			
(Almora)						
High Hill	28%	24%	21%			
(Bageshwar)						

# Hypothesis 4:

# There is no significant relationship between digital literacy and the use of agricultural mobile applications.

Digital Literacy	Average App Usage Rate (%)	<b>Correlation (r)</b>	p-value	Significance
Level				
High (Score 7-	42%	0.19	0.07	Not Significant
10)				
Medium (Score	23%			
46)				
Low (Score 0–3)	11%			

# Hypothesis 5:

# There is no significant correlation between information access and crop diversification.

Info Access	Avg. No. of Crops	Correlation (r)	p-value	Significance
Score	Cultivated			
High (Score	4.3	0.14	0.13	Not Significant
8–10)				
Medium (5–7)	3.7			
Low (0-4)	3.4			

# Interpretation of data:

# Hypothesis 1: Income vs. Information Access:

The t-test result (p = 0.148) indicates that there is no statistically significant difference in income between farmers who regularly access information and those who do not. While those with regular access had slightly higher income on average, the difference is not large enough to conclude that information access alone drives income growth.

# Hypothesis 2: Gender Disparity in Information Access:

The chi-square test ( $\chi^2 = 21.43$ , p < 0.01) shows a statistically significant difference in access to agricultural information between males and females. Male farmers are more likely to access information and use digital tools, highlighting a gender gap that needs targeted policy and training interventions.



# Hypothesis 3: Altitude Impact on Market/Weather Info Access:

The ANOVA test shows no significant difference (p = 0.09) in market or weather information access across altitude levels. This means that altitude is not a determining factor for receiving agricultural information, suggesting uniform challenges or efforts across terrains.

# Hypothesis 4: Digital Literacy and Mobile App Use

The correlation coefficient (r = 0.19, p = 0.07) suggests a weak and statistically insignificant relationship between digital literacy and mobile application use. This may imply that even digitally literate farmers do not necessarily adopt agri-apps, possibly due to trust issues, content irrelevance, or interface difficulty.

# Hypothesis 5: Information Access and Crop Diversification

The correlation (r = 0.14, p = 0.13) between information access and crop diversification is not statistically significant. This means that access to information alone does not strongly influence a farmer's decision to diversify crops, possibly due to market constraints or risk aversion.

# **Recommendations:**

# **Localization of Digital Content:**

- Develop agricultural content in regional dialects like Kumaoni and Johari to enhance understanding and usability.
- Promote voice-based interfaces in local languages for low-literate users.

# **Gender-Sensitive Outreach Programs:**

- Implement digital literacy workshops specifically for rural women.
- Appoint and train female agricultural extension workers to increase trust and engagement among women farmers.

# **Strengthening Community-Based Information Systems:**

- Collaborate with Krishi Vigyan Kendras (KVKs), Panchayats, and Self-Help Groups to disseminate agricultural information.
- Encourage peer-to-peer knowledge sharing through local farmer networks.

# **Enhancing Digital Infrastructure:**

- Improve mobile network and electricity access in remote and hilly villages through public-private partnerships.
- Set up agri-tech kiosks or digital resource centers at Panchayat level.

# Integrated Agricultural Advisory Services:

- Create a single-window system (app/web-based) offering weather updates, market prices, expert advice, and scheme eligibility, customized for the hill region.
- Promote platforms that combine government advisories with real-time inputs from local experts and successful farmers.

# **Capacity Building and Trust Building:**

- Provide hands-on training on using agri-apps and online tools to improve confidence.
- Design interventions that build trust in digital solutions through pilot demonstrations, success stories, and continued handholding.

# Monitoring and Evaluation:

• Conduct periodic assessments to evaluate the effectiveness of information dissemination channels.



Incorporate user feedback to adapt and improve digital solutions continuously

# **Conclusion of the Study:**

Quantitative analysis showed that farmers who regularly accessed agricultural information—through digital platforms or formal channels—had slightly higher average incomes and better decision-making capacity. However, this difference was not statistically significant. Similarly, access to information did not result in increased crop diversification. These findings suggest that infrastructure challenges such as limited market linkages, inadequate financial services, traditional practices, and infrastructural bottlenecks dilute the potential economic benefits of information access.

A notable insight of the study is the significant gender disparity: male farmers have notably higher access to agricultural content and digital tools compared to female farmers. This gender gap calls for urgent gender-sensitive interventions, including women-centric digital literacy programs, female-led extension services, and outreach mechanisms that specifically target rural women.

The study also found no significant impact of altitude (low, mid, or high hill regions) on access to market or weather-related information. This indicates that the barriers to information are systemic rather than geographical, rooted in infrastructure gaps, weak digital ecosystems, and insufficient last-mile delivery of advisory services.

Moreover, rising digital literacy levels did not correlate with increased use of agricultural mobile applications. This points to deeper issues—such as mistrust in digital content, language barriers, lack of personalized support, and poor app usability—that limit the effective adoption of technology in hill agriculture.

Qualitative findings from Focus Group Discussions and key informant interviews emphasized that farmer's value localized, trustworthy, and easy-to-understand information, preferably delivered through community-based structures like Krishi Vigyan Kendras (KVKs), Panchayats, local NGOs, and peer networks.

# **References:**

- 1. Kumar, R., & Bhatia, A. (2022). *Digital divide and agricultural access: Challenges in rural India*. Indian Journal of Rural Development, 41(1), 34–48.
- 2. Mehta, S., & Joshi, V. (2021). Digital literacy and technology adoption among hill farmers in *Uttarakhand*. Journal of Hill Agriculture, 12(3), 89–97.
- 3. Pant, R. (2019). The role of traditional media in disseminating agricultural information in the *Himalayas*. Agriculture and Society, 28(2), 101–115.
- 4. Rawat, D. (2022). *Policy gaps in hill agriculture: The case of Uttarakhand*. Himalayan Journal of Social Policy, 6(1), 45–62.
- 5. Sharma, P., & Patel, N. (2018). Assessing the impact of mobile-based agricultural services in *India*. Journal of AgriTech Studies, 15(4), 123–135.
- 6. Singh, H., Kaur, G., & Tyagi, R. (2020). *ICT for agriculture in India: Potentials and pitfalls*. International Journal of ICT and Agriculture, 8(2), 67–80.
- 7. Verma, A. (2020). Infrastructure challenges in mountainous farming areas: A review. Rural Technology Review, 9(1), 55–63.
- 8. World Bank. (2021). *Transforming agriculture through digital innovations: Lessons from India*. World Bank Agriculture and Food Global Practice. <u>https://www.worldbank.org/en/topic/agriculture</u>



- 9. FAO. (2019). *Digital technologies in agriculture and rural areas: Briefing paper*. Food and Agriculture Organization of the United Nations. <u>http://www.fao.org/3/ca4887en/ca4887en.pdf</u>
- 10. Government of India. (2020). Report of the Committee on Doubling Farmers' Income by 2022 (Vol. XII: Digital Technology in Agriculture). Ministry of Agriculture and Farmers Welfare.
- 11. Balaji, V., Meera, S. N., & Dixit, S. (2017). *ICT-enabled knowledge sharing in support of extension: Addressing the agrarian challenges of the developing world*. Journal of Agricultural Education and Extension, 23(2), 95–111. <u>https://doi.org/10.1080/1389224X.2016.1263671</u>
- 12. Mishra, R. K., & Kumar, A. (2021). Barriers to agricultural technology adoption among Indian farmers: A literature review. Journal of Rural Development and Planning, 18(2), 87–105.
- Sulaiman, R. V., & Hall, A. (2019). The fallacy of universal solutions in agricultural extension: Challenges for scaling and institutionalizing innovations. Agricultural Systems, 176, 102658. <u>https://doi.org/10.1016/j.agsy.2019.102658</u>