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Need Based Information Media for Farmers in Hill Regions of Uttarakhand: Implications for Extension

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ABSTRACT

Farmers use different information sources and channels for seeking reliable, timely and relevant information on improved agricultural practices. Developing appropriate farmer educational and marketing strategies will depend on how farmer groups differ in their information search behavior. Understanding what information farmers need, how they search for their information, which sources they depend on for accessing information can help in designing effective extension programs. The study examined farmer's communication characteristics with an intent to assess farmer's accessibility and use of extension media and information sources for fulfilling their information needs pertaining to agricultural and allied activities in three hill districts of Uttarakhand state. A sample of 1318 farmers was selected through a stratified random sampling technique. Interpersonal communication sources were used more by farmers as these were more easily available and accessible to obtain information related to agriculture. *Majority of farmers were categorised as low searchers.* Gender, primary occupation, land size and education significantly affected search behaviour of farmers. Implications for policy and extension have been given for improving information dissemination among farmers of hill regions. Emphasis on extension system providing a context for the flow of authentic knowledge through authentic media among farming communities on an equal basis is emphasized.

INTRODUCTION

Agricultural information is one of the very crucial inputs for rural development. The agriculture sector is progressively becoming knowledge intensive and the researchers are continuously coming up with new pool of information to enhance agricultural production and productivity. There is an extensive accumulation of knowledge and information at regional, national and international level. What remains important is the timely dissemination of the generated information to the stakeholders for its effective use in practical conditions. This calls for making relevant and useful information available to farmers timely and easily through available channels. Making information accessible to the farmers can play a vital role in enhancing farm productivity and sustainable growth of agricultural activities. Timely and appropriate information helps the farmers to decide upon various aspects like crop varieties, selection of crops, insect pest management, choice of market, weather trends, etc.

Information needs of rural farmers are changing over time (Elly et al., 2013). In the era of rapid climate change, farmers need to make decisions regarding change in crop production practices, rainfall predictions, soil nutrient management, varietal selection, crop diseases and pest information based on available scientific information generated and validated by crop experts. Farmers seek scientific information for remedial every season as with the incidence of new insect-pest infestations and diseases. An efficient and effective, readily accessible information system may help farmers to open up and avail opportunities to improve their livelihoods (Ballantyne, 2005). Thus, response to the changing information

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needs of farmers is indispensable to improve farmer's understanding, decision making, and management of farming activities. Mudukuti & Miller (2002) suggested that in this information age, dissemination of need based information and applying this information in the process of agricultural production will play a significant role in the development of agriculture-based livelihoods.

Screening the specific information needs of farmers paves the way for designing strategies to address information needs of farmers (Musi et al., 2004; Nain et al., 2019a; Nain et al., 2019b). Location-specific information promotes adoption of technologies. Not only for programme developers, it is also giving necessary inputs to policymakers, researchers, and technologists to design need-based policies, programmes and innovations. Through need assessment exercises, farmers also understand what they actually need and eventually decide the information product that is best to fulfil their information needs. Any programme that considers farmers needs has a great chance of success and adaptation (Islam & Gronlund, 2010). It also applies on extension programmes which have more chances of failure in absence of feedback from farmers and reach to farmers, thereby reducing the relevance of the content of the programmes. The present study is a part of project on developing information dissemination system(s) for farming community of hill regions of Uttarakhand state. The assumption was that the knowledge of information needs of farmers in the surveyed areas will provide baseline information for future planning and establishment of effective agricultural information dissemination system in rural hill farm communities. Based on the information needs and the accessibility of media by farmers of the selected districts, an information media was developed to cater their information needs.

METHODOLOGY

Uttarakhand is the 27th state of Republic of India. There are 13 districts in Uttarakhand which are grouped into two divisions, Kumaon and Garhwal. The study on "Information dissemination system(s) for empowering farming community of Uttarakhand" was conducted by ICAR-VPKAS, Almora in three hill districts namely Almora, Bageswar and Uttarkashi. This paper explains the findings of four village clusters namely Shama, Nakuri, Patiya, and Himrol. The village clusters (each cluster comprises of 3 villages) were selected based on the discussion with the Expert team comprising the KVK expert, NGO representative, Government representative, progressive farmer and agripreneur of the respected districts. Survey method was used to conduct the study and questionnaire was used as a data collection tool for fulfilling the objectives of the study. Sample size of the cluster was determined using sample size calculator at confidence level of 95 per cent. The number of respondents from each village of the cluster was determined using probability proportionate sampling method.

The information seeking behaviour of farmers was taken as the dependent variable. These variables were taken only for finding out any difference in information search behaviour of farmers across their socio-personal domains. Farmer information search behaviour was identified using a cluster analysis based on the number of sources of information used, frequency of use of the information source (352=daily, 52=weekly, 12=monthly, 4=quarterly, 2=half yearly, 1=yearly, 0=none these points were calculated on per year basis) and the number of sources from which information was tried. Further farmer's importance of source for information was gauged on using a six-point Likert scale (0= not important, 1= less important, 2= neutral, 4= somewhat important, 5= very important and 6=highly important). Further frequency of use of information sources and farmer's importance of source for Information marks were multiplied together to obtain a Utility score. Further correlation between age, education, landholding, gender, risk orientation, economic motivation and value orientation to Communication sources were analysed.

RESULTS AND DISCUSSION

Information search behaviour of farmers

Information search behaviour of farmers was calculated based on number of information sources used for accessing farm related information. For this, cluster analysis was performed to identify homogenous subgroups of farmers with similar information source usage. To identify the subgroups, information source index was calculated & hiercherial clustering technique was employed (Fig. 1). The information search behaviour of farmers is shown in Figure 2.

Most of the farmers fell into low searcher category (43.93%) followed by high searchers (36.79%) while only a few (19.27%) fell into moderate searchers category. It can be inferred that majority of farmers were not making use of multiple information sources. Farmer's ability to search for information depends on the sources that are accessible to farmers. Information sources were categorised under three-point scale often, sometimes and never for which 3, 2 and 1 marks were assigned, respectively and average weighted mean was calculated from theses assigned marks. Table 1 depicts the average weighted mean for different information sources.

Table 1 shows that the majority of the respondents contacted with contact farmers, friends/ neighbours and shopkeepers, which might be due to the easy availability, timeliness, need based and understandable content of message delivered by these sources. Some of the respondents contacted with rural leaders and least of the

Table 1. Frequency of contact with information sources

Frequency of contact with interpersonal sources	Average weighted mean
Friends/neighbours	2.76
Rural leaders	2.02
Village Development Officer	1.46
Block Development Officer	1.10
Other farmers	2.79
Shopkeepers	2.11
Scientists	1.45
Frequency of contact with mass media sources	1.27
Radio	2.35
Television	2.44
Telephone/mobile	1.08
Tape recorder	1.47
Video	1.73
Newspaper	1.20
Magazine	1.55
Pamphlet	1.74
Hoardings/boards	1.34
Plays	1.64

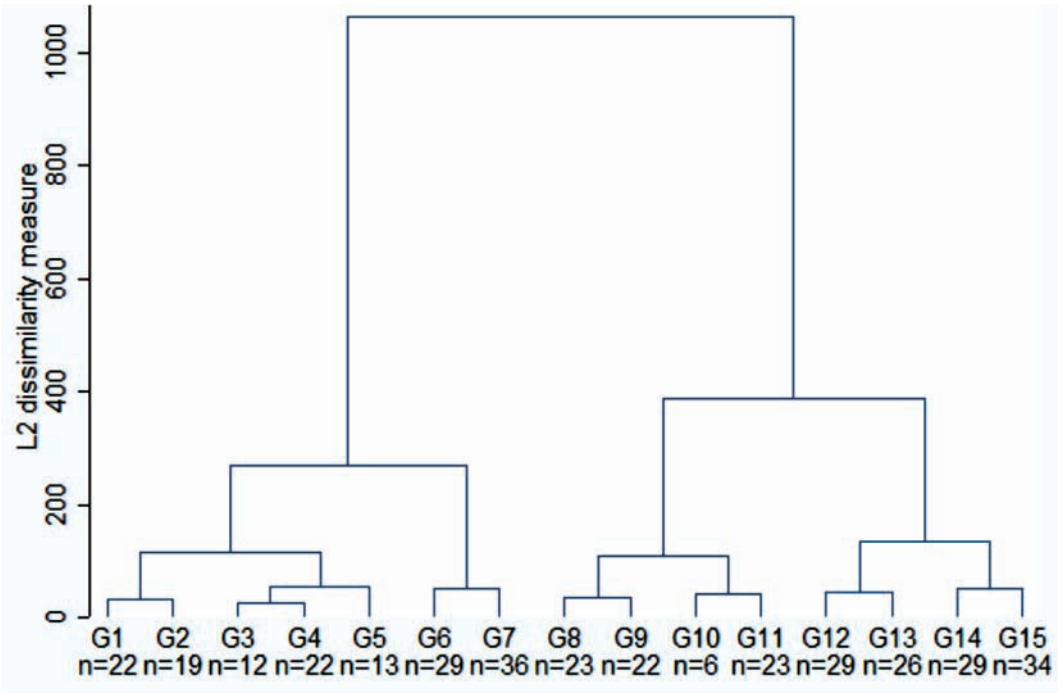

Figure 1. Dendogram of information search behaviour of farmers

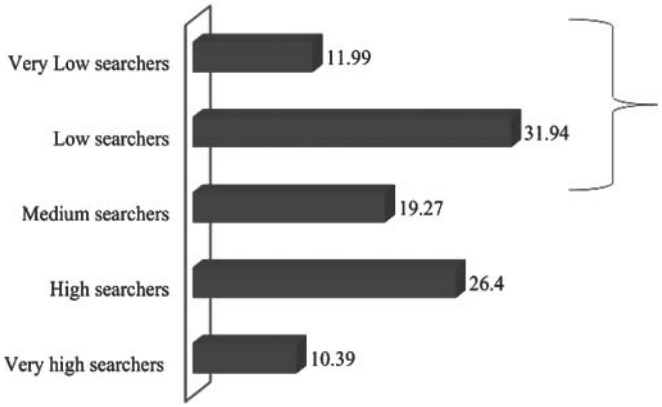

Figure 2. Information search behaviour of farmers

respondents contacted with Block Development Officer, Scientist and Village Development Officer for agricultural related information which may be due to lack of reach of farmers or unavailability of these sources in near proximity. Similar results are reported by Bhagat et al., (2004); Nain et al., (2015); Sharma et al., (2020) who also reported use of contact farmers as the most accessible source, followed by the state department of extension staff, and while Television and radio were used least. It is inferred that panchayat meetings, telephone/ mobile and television were the most contacted mass media sources by the respondents whilst some of the respondents rely on demonstration, fair/ exhibition, announcement, etc. for information.

Analysis of variance showed variation in information search behaviour of farmers across socio-economic characteristics. Information search behaviour varied across gender, farming as primary or secondary source of livelihood, caste, education and land holding (Table 2). It is also inferred by studies (Deichmann et al., 2016; World Bank, 2016) that the widespread uptake of advisory or information is sometimes been limited by differences in the degree of access to mobile phones, related to factors such as gender or wealth status.

Major information needs of the farming community

On the basis of data received from different items related to sixteen sub-heads mentioned in interview schedule and the data collected through village survey and field visits was triangulated to identify the specific information needs of farming community in selected village clusters (Table 3). Respondents were asked to categorize each mentioned item into 'Not Needed', 'Needed' and 'Most Needed' which were scored as 1, 2 and 3, respectively. Based on their responses, the weighted mean score for each mentioned

Table 2. Search behavior clusters by sociodemographic characteristics

Information search behaviour	Very high	High	Medium	Low	Very low	ANOVA
Age	47.31	48.83	49.31	48.71	50.01	F=1.14, P>F=0.3365
Gender	0.788	0.724	0.709	0.682	0.652	F=2.12, P>F=0.0764
Main source of livelihood	0.321	0.422	0.331	0.116	0.038	F=40.74, P>F=0
Alternate source	0.029	0.060	0.059	0.086	0.089	F=1.74, P>F=0.1379
Caste	0.350	0.250	0.327	0.366	0.411	F=4.14, P>F=0.0015
Education	1.759	1.833	1.680	1.540	1.180	F=19.02, P>F=0
Land holding	1.189	1.169	1.141	1.081	1.044	F=6.75, P>F=0
Family Type	0.562	0.514	0.492	0.496	0.551	F=0.78, P>F=0.54

Table 3. Information needs for the different clusters

Information need	Weighted mean score
Crop related	
Cereals	2.71
Pulses	2.20
HYVs/ Resistant/ Early varieties	2.33
Land and soil related	
Land preparation	1.55
Moisture conservation	1.56
Soil testing	2.94
Seed/planting material related	
Seed treatment	2.06
Good quality seed	2.04
Sowing related	
Time/ Method/ Depth of sowing	2.94
Plant population	1.97
Seed rate	2.93
Intercultural operations	1.78
Fruit/vegetable/flower cultivation related	
HYVs	2.43
Intercultural/ Post-cultivation operations	1.98
Nursery raising	2.85
Post-harvest management	1.76
Storage related	
Management of pests	1.99
Storage techniques	2.19
Cold stores	1.59
Fertilizer-related	
Need of nutrients	2.28
Optimum dosage	2.03
Application techniques	2.09
Organic fertilizers	2.19
Plant-protection related	
Insect/pest identification	2.33
Organic pesticides	1.70
Dosages/ Precautions using insecticides	1.89
Biological plant protection	2.97
Weed management related	
Prominent weeds	2.21
Use/Precautions of herbicides	2.20
Irrigation management	
Irrigation techniques	1.78
Time/ optimum water for irrigation	2.18
Crop stages of irrigation	2.23
Policies offered by government	2.41
Farm implements related	
Requirement of implements	1.77
low-cost farm implements	1.97
Women friendly implements	2.16
Animal (cattle/poultry/goat/sheep) rearing related	
Suitable breed	1.71
Vaccination/disease management	1.89
Nutrition/Fodder management	2.10
Marketing of product	2.17
Government policies	2.46
Loan and marketing related	
Sectors for loan available	2.14
Procedure to obtain	2.29
Energy conservation related	
Energy conserving structures	1.98
Solar energy	1.89
Smokeless Chulha	1.83
Miscellaneous	
Weather predictions	1.67
New innovations	1.89
Agricultural updates	1.99
Mushroom cultivation	2.82
Bee keeping	1.50
Sericulture	1.32
Development programs	1.89
Prevention to wild animals	2.81

item was calculated ranging from 1 to 3. Information needs were further categorized as 'Not important', 'Important' and Most Important' based on calculated "Mean (2.02) ± Standard deviation (0.49)". The study findings (Table 3) show that there were some overlapping and some different types of information needs.

The information needs of farming community varied from cluster to cluster as the climatic conditions and crop profile of the clusters was quite different from each other.

Developing tailor-made information and media packages

To cater the information needs of the farmers, a package was developed through participatory mechanism. The content was selected, messages were treated for ease of understanding in local language. We observed farmers interactions with these prototypes and recorded their usage behavior, including misunderstandings and redundancies. Users' perceptions of the various media- text, video, audio and took decisions on the eventual design were discussed. Based on the decisions taken with farmers, the characteristics of the package were determined. The treated and accepted messages with ease of understanding in local language were eventually uploaded in form of a mobile app. According to the altitude from the mean sea level, regions were categorised as per altitudes of hill regions. The information was further organised under three media- audio, video and text.

In selected village clusters demonstration for the mobile application (e-Sanchar) were successfully organized, the application was installed in mobile of 39 farmers from mid hills (Patiya in Almora district) and higher hills (Shamaof Bageshwar district) and perception and attitude towards e-Sanchar mobile application was examined. Majority (74.36%) of respondents had medium perception, followed by high (20.51%) and only 5.13% have low perception about the e- Sanchar mobile application. Most (71.79%) of the respondents have medium attitude, 15.38 per cent have high and 12.82 per cent low attitude towards the e-sanchar mobile application. Majority (71.79%) respondents have medium impact, followed by low 20.51 per cent and 7.69 per cent have high impact of mobile application after 6 months of usage. Most of the farmers were of the opinion that they have much access to information at their fingertips now and the mobile app also solved the constraint of mobility. However, in high hills, in one of the clusters, the network connectivity was a problem, but they were assured that the connectivity was soon to be availed in the area by the local government's efforts. For such print media was provided on their information needs.

In order to develop a successful and feasible information dissemination mechanism for farmers, what farmer's need, in which form, when and through which media-is an important aspect to consider. The communication profile and information search behaviour of the target farmers must be examined before developing any information dissemination mechanism. It is found that in hills usually the farmers depend upon the informal sources of information pertaining to agriculture, which could be due to their constraints in mobility from one place to another because of lack of facilities and proper infrastructure. Singh et al., (2020) also reported similar results for usage of informal sources of information by Maniupri farmers. Sharma et al., (2008) also reported that personal localite

sources like neighbours, friends, progressive farmers and opinion leaders were playing important role in transfer of technologies to the fellow farmers. The farmer's need for agricultural information varied across clusters and altitude. It can be supported with the finding of Kaniki (2003) who suggested that the level of information needs may differ between individuals or groups depending on a variety of factors such as demographic factors, economic characteristics, or information source characteristics such as availability and ease of use. Study by Babu et al., (2012) reported that the major information needs of rural smallholder farmers were related to pest and disease management. Singh et al. (2003) interviewed farmers in Haryana and found that progressive farmers were the most frequently accessed information source. Small farmers cited market prices, weather information, information on diseases and plant protection, and seed information as their top needs (Mittal et al., 2010; Panda et al., 2019).

There remains a heterogeneity among the hill farmers with more credibility to formal sources of information while more access to the informal sources, which is due to gap ion our extension mechanism. The study found difference in information needs of farmers from mid and high hills regions, highlighting the need of context specific, demand driven information disseminating mechanisms. Such mechanism, well supported with an enabling environment may help in bridging the information gap between the new emerging advances in agriculture and farmer. Similar procedures were followed by Berta Ortiz-Crespo et al., (2020) while designing a user centred advisory service. It also provides a feedback mechanism to the researchers or technologists to put their concern on decentralized, demand driven technology development. As agriculture is seasonal, the incidence of new problems, challenges also remains dynamic and needs time bound, assured, authentic solutions to the problems. Any information dissemination plan when planned and developed in a participatory manner will be well received and adopted by the farmers.

CONCLUSION

An understanding of farmer's need, in which form, how they access information, and the factors which affect the information search behaviour of farmers will also provide the guideline to the programme developers to design demand driven context specific media/packages which will succeed in fulfilling the aim of designing such programmes. Our study shows that, a mobile advisory service, created through a participatory manner, can help to address the communication and challenges of information dissemination in hill agriculture. During the pilot, a high segment of farmers actively used the package, demonstrating its prospective effectiveness to improve farmers' access to agricultural information. In hill regions, where lack of infrastructure and tough terrains for frequent mobility is a constrain, extension system providing a context for the flow of authentic knowledge through authentic media among farming communities on an equal basis is appreciated by farming community.

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