

# **PERCEIVED EFFECTIVENESS OF INFORMATION SOURCES IN MEETING INFORMATION NEEDS OF RICE GROWERS IN NEPAL**

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**Abstract:** A study was done to assess the effectiveness of different information sources in meeting information needs and utilization behavior of rice growers in western midhills of Nepal, taking 101 sample households. Survey design with a structured questionnaire was used for data collection under the pragmatic paradigm of social research. The study showed that 30 percent of farmers were high information seekers while about 59 percent were utilizing information highly implying that most farmers were using the information highly though they don't seek information by themselves. Input management and climatic information were highly sought and utilized. Though fellow and contact farmers were the more used source of information, however, respondents felt that extension personnel and agro-vets were more credible. An assessment of the effective index showed that fellow farmers were highly effective followed by extension personnel and agro-vets while social media and ICTs were least effective. There was a significant positive correlation between information variables and education, ethnicity, number of crops grown and accessibility to information sources. However, poor accessibility of farmers to these sources was a major problem. Thus, a suitable information delivery system accessible to most farmers according to their time and needs should be designed regarding rice cultivation.

**Keywords:** *Information needs, Information sources, Information utilization, Rice cultivation*

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## **INTRODUCTION**

With the recent increase in world population which is expected to reach more than 8 billion by 2025, and rising income in developing countries, it is believed to generate enormous demand for food, especially in Asia, Africa, and Latin America (FAO, 2010) and about 25% of more rice will be required by 2025 (IRRI, 2009). In regard of this context, different approaches have been implemented for significantly accelerating the application and diffusion of agricultural innovations, technologies and knowledge in enhancing food and agricultural production during past decades focusing on four essentials: national stability, political commitments, growing research and extension capacity and a motivated farming community (Tripathi, 2013).

Outdated technologies often result in lower productivity and higher losses, and lack/insufficient technical knowledge puts farmers in economic disadvantage. Moreover, agriculture is becoming more and more knowledge-intensive day by day due to the need to participate in the global competitive market, need for sustainable use of natural resources, and cope with growing risks from wide climatic fluctuations (Maru & Pesce, 2008). Thus, knowledge and information has been now recognized as the most critical resource for agricultural development. "*Information is a source of learning, but unless it is organized, processed, and made available to right people in the right time for decision making, it is a burden*" (quote by William Pollard). Agricultural information comprises of various information and messages

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relevant to agricultural production activities of farmers including crop, animal and natural resource production and management (Tadesse, 2008). It is accessed by rural farmers via different sources. However, their efforts in accessing this knowledge and information from available sources for improved production and technologies are confronted with certain constraints (Adio et.al, 2016). Aina (2008) observed that there exists a wide gap between available knowledge of improved technology and actual practice in farmers' level and the missing link between research and sustained production is the lack of effective service delivery services, especially the information about innovations and improved technologies. Hence, information sources must be effective and beneficial in fulfilling the knowledge and providing technical assistance for farmers to improve agricultural production through diffused and modern improved technologies.

Nepal's agriculture system is shifting from subsistence to commercial and diversified farming (NPC, 2007), and even with considerable efforts from government and private sectors for increasing agricultural productivity, still, the problems of production potentiality gap and effective marketing of agricultural products exist which can be owed to the gap in the availability of research-based scientific knowledge, its dissemination, and utilization at farm level (Pokharel et al., 2015). Lower productivity has been an issue for rice cultivation in Nepal since long (Baral, 2018). Various improved varieties and technologies are being introduced during the last few years, but it is still unknown whether the farmers have been actually benefitted from them or not (Kafle et al., 2012). The information sources and tools used for dissemination of improved technologies of rice cultivation is not able to best meet the need of farmers despite the various attempts to improve farmers livelihood through increased productivity and overall performance of rice production has been inadequate. There exists information gap in farming community about the significance and utility of improved rice varieties due to which the rate of adoption of such varieties is lower than as expected. Even for rice farming and production, information seems to be a critical resource in the operation and management of the farm and solving production and marketing constraints. Timely availability of relevant information appears to be vital for effective managerial functions in rice farming (Pezeshki-Rad & Zamani, 2005).

There are three main components of the agriculture information system which are important for commercialization of the agricultural sector—information generation, information dissemination, and information utilization. But, in this digitalized era, information generation and dissemination are not as challenging as the effective and efficient utilization of information for farm decisions by the farmers which appears to be a real concern. The information behavior of farmers is the totality of human behavior concerning information parameters like information seeking and information utilization which is influenced by their information needs (Wilson, 2000), perceived reliability and credibility of the source, personal characteristics, nature of information, and information related problems with their solutions. It is, thus, essential to understanding the information seeking and utilization behavior of farmers for wider adoption and effectiveness of the technology. A critical analysis of farmers' information behavior in terms of use of modern Information Technology (IT) and constraints of access and use of information could help identify the ways and means of farmers' needs-based information generation and dissemination to rice-growing farmers. This study was designed to analyze and describe the information behavior of the rice-growing farmers in the western mid-hills of Nepal concerning the following research question:

- a) What are the major information needs of rice growers in the study area?
- b) What is the extent of information utilization by the farmers?
- c) Are information sources effective in delivering the relevant information to the farmers as per their needs?
- d) What is the relation of information seeking and information utilizing behavior of farmers with different independent variables?

## RESEARCH METHODS

Any successful research requires the appropriate planning including objectives and methods of study before taking any actions. An attempt is being made to assess the information parameters (including information need, available information sources, diffusion of technologies by information sources, information utilization by respondents, preference and credibility of information sources and their perceived effectiveness) in the western mid-hills of Nepal. Two municipalities, Bhanu and Rainas Municipal were selected due to their feasibility. The study is being done under the pragmatism paradigm where

the utility and effectiveness of the information sources are being assessed using mixed (both qualitative and quantitative) methods (Neuman, 2000).

The survey design was incorporated for the study with a farmer's household used as a unit of analysis. It involved the use of standardized questionnaires and interviews for data collection in a systematic manner. The design was selected because of the limited time for collecting data and the design being flexible and simple which allowed for both qualitative and quantitative data collection.

The sampling size was estimated using the formula:

$$n_0 = \frac{z^2 pq}{e^2}$$

Where; e is the desired level of precision (i.e. the margin of error), here a 5% margin error was considered; p is the (estimated) proportion of the population which has the attribute in question, here 90% (90 percent of farmers were rice growers); q is 1 – p i.e. 10% (0.1).

The formula gives a sample size of 138. As the study areas had 378 households meeting our criteria (i.e. growing rice for more than 40 years), a modified formula was used for estimating required sample size which is as follows:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Here, N = no. of commercial rice growers (target), 378 in study areas.

Using these formulae, the required sample size was calculated to be 101. Judgmental Sampling technique was used for selection of the study

households to ensure representation from different groups and key participants based on gender, socio-economic class and caste.

For primary data collection from the selected respondents, a structured interview schedule was prepared and its reliability and validity were ensured through experts' consultation and pretesting by interviewing five respondents so that the schedule covers the overall objectives of the study. Also, a FGD and on-site observation were done to analyze and record qualitative data and behavioral aspects of respondents. Detailed interviews were conducted and collected data were carefully managed and analyzed using Ms excel and STATA 12 using analytical tools like frequencies, means, standard deviation, rank order and correlation.

The composite indexing was done for assessing the effectiveness of information sources perceived by the respondents, named as the effectiveness index (EI). The following parameters were used for determining EI.

1. Accessibility by farmers (A).
2. Timeliness of information delivery (T).
3. The relevance of the content to farmers' context (R).
4. Reliability and utility of the information delivered (U).
5. Ease of understanding and problem solving (P).
6. Satisfaction (S).

Each parameter was given equal weightage of 1 point by a team of experts, whereas their score was to be calculated from ratings by respondents in 5 point scale and the following formula was used to calculate the effectiveness index.

$$\text{Effectiveness Index (EI)} = \frac{A * W1 + T * W2 + R * W3 + U * W4 + P * W5 + S * W6}{W1 + W2 + W3 + W4 + W5 + W6}$$

Where, W1, W2, W3, W4, W5 and W6 are weightage of the variables of effectiveness index

mentioned above and were given equal weightage of 1 by experts

## RESULTS AND DISCUSSION

### Socio-economic characteristics of households

Table 1. Socio-economic parameters of study households

Descriptive	Statistics
Social	
Average age of the HHH (year)	52.74±1.14
Average years of schooling of HHH (years)	4.52±0.50
Literacy percentage of HHH.	89.1%
Average family size	5.10±0.17
Ethnicity	Brahmin and Chhetri, Indigenous and Dalits

Rice Farming Experience (years)	49.31±1.06
<b>Economic</b>	
Main occupation	Agriculture (62.4 %), Remittance (14.8 %), Service (13.9 %) and Business (8.9%).
Average income monthly (NRs)	36217.82±1506.55
Average land holdings (ha)	0.43±0.62
No. of crops grown	3-6
Average area of rice cultivation per HH	4.17±0.24
Average rice yield per HH (kg)	628.57
Average productivity of rice	2.63 mt.ha <sup>-1</sup>

Table 1 presents the socio-economic characteristics of the study households. The study results show that more than two-thirds of the household heads, about 70.6% were economically active whereas the remaining 29.4% were economically inactive. Also, the average age of the household head was found 52.74 years which can be considered as experienced farmers' age group. This age structure implies that most of the respondents were in the active working group and could take risks in agriculture (Baral et. al, 2018). They were more likely to try innovations, evaluate and adopt them if found promising and hence, they have a high inclination towards newer information and innovation (Nzully, 2007). The literacy rate was quite high (about 89 %), about 77% of them had formal education (primary, secondary or above), and 12% of them had attended adult literacy classes, while 11% had not attended any education (illiterate). Ethnicity is an important socio-demographic character which determines the level of different group exists in these areas. The study revealed that the majority of the respondents were Brahmin and Chhetri group (65 %) followed by the indigenous group (25.8%) and Dalits were only about 9%. The average family size in the study area was 5.10, quite close to the national average of 4.88 (CBS, 2016). Also, the average year of rice farming was found 49 years.

Looking at the economic dimension of households, 62.4% of households had agriculture as their primary income source similar to national data of 61% (CBS 2011). This followed by remittance (14%) and service (13%). Also, the average landholding in the study area was 0.42 ha while the average area of rice cultivation was 0.21 ha (MoALC 2015), implying that rice cultivation was done in about 50% of total landholding. The number of crops grown varied from 3 to 6 and the average productivity of rice in the study area was 2.63 mtha<sup>-1</sup>, which was quite lower than the national average i.e. 3.33 mtha<sup>-1</sup> (MoAD, 2017). The respondents pointed the limitations in timely availability of

inputs (seeds, fertilizers, and pesticides), lower knowledge on improved practices (like alternate wetting and drying of rice field, SRI etc.) and climatic factors (irregular rainfall, hailstorms etc.) in such lower productivity of rice in study areas.

### Information seeking behavior and information needs of respondents

Information seeking behavior explains the interest and enthusiasm of farmers in assessing the information about newer, improved and innovative technologies. The information-seeking nature of the respondents is presented in Fig 1. It was found that 30 percent of respondents were seeking information regarding rice cultivation highly from the different information sources while 48 percent had medium and the remaining 22 percent had low information-seeking behavior.

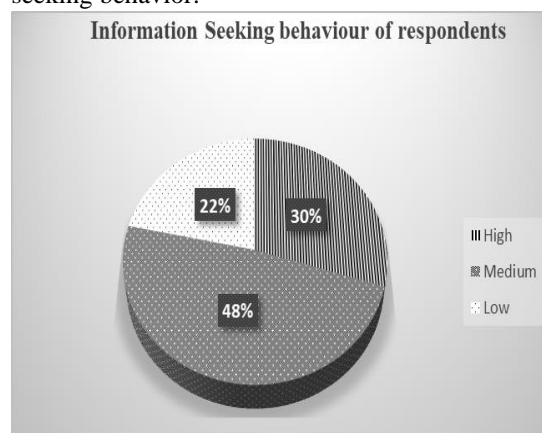


Fig 1: Information seeking behavior of respondents

Also, the information needs of the respondents were studied as it directly relates to their information seeking nature. It was done by asking the respondents to rate the information by using scale values of 4, 3, 2, and 1 as most needed, much needed, needed, and less needed respectively as perceived by them. Later on, the mean score and mean of the means were computed. Based on the mean score different information needs were ranked as presented in Table 2.

Table 2: Information needs of respondents

Information needs	Mean score	S.D	Rank
Cultivation information	2.10	0.81	V
Varietal information	2.43	0.50	IV
Input management information	3.37	1.11	I
Market information	2.47	0.83	III
Climatic information	2.83	0.89	II

Table 2 revealed that most respondents needed information regarding input use and management in rice cultivation followed by climatic information, market information, varieties related information and cultivation information respectively. Regarding input management function, they were seeking information about efficient fertilizers and nutrient source for rice farming and forecast of disease and insect incidence and their control.

Also, they were looking for irrigation management strategies regarding rice cultivation as they had limited access to irrigation water. Regarding climatic information, farmers demanded the timely forecast of weather in regular intervals of time and information on the adaptation of the varieties to changing climatic conditions. In the case of marketing information, they demanded the present price of rice grains according to varieties followed by quantity traded and export potential. In varietal information, farmers mostly desired to get information and characteristics of the improved varieties of rice. Lastly, under cultivation practice, farmers wanted to know about the improved package of practices and technologies about rice cultivation.

#### Information sources as per needs of respondents

Information sources are tools for meeting the information needs of the farmers. These sources depend on the type of work and the desire of respective farmers. Koyenikan (2011) has categorized information sources as formal and informal sources. The formal sources, according to him, are radio stations, local and international print media (such as newspapers, newsletters, and journals) and seminars/workshops, while the informal sources are farmers, family friends and personal assessments and judgment.

Table 3. Information needs and preferred information sources

Information needs	Preferred Information Sources
Cultivation information	Fellow farmers, Agrovets and cooperatives, Extension Personnel
Varietal information	Agrovets and cooperatives, Fellow farmers, Printed Media.
Pest management information	Agrovets and cooperatives, Extension Personnel, Fellow farmers
Market information	Fellow farmers, Extension personnel, Social Media
Climatic information	TV and radio, Social Media, Extension Personnel

Based on this, the information sources widely used in the study areas were broadly classified into 6 groups namely, Broadcasting media (TV and Radio), Social media and ICTs, Printed media, Fellow/Contact farmers, Extension personnel and agencies and lastly, Agro-vets and cooperatives. The formal ones are broadcasting media, printed media, extension personnel/agencies and agro-vets/cooperatives while the informal ones are fellow/contact farmers and social media. The respondents were then asked to select any 3 preferred information sources regarding their information needs. The result is presented in Table 3.

#### Diffusion of relevant technologies by the sources as perceived by farmers

The respondents were asked to rank and give their perceptions regarding the level of diffusion of recommended technologies by the information sources based on a 5point scale (1 for highly diffused and 0.2 for low diffusion), the result of which is presented in Table 4.

Table 4. Diffused technologies by information sources as perceived by respondents

Technologies	Mean Score	Rank
Varieties selection	0.83	II
Improved cultivation practices	0.66	IV
Doses and techniques of input use (Seeds, fertilizers)	0.87	I
Identification and control of pests and diseases	0.67	III

Irrigation and water management	0.63	V
Harvesting and post-harvest handling	0.45	VII
Marketing channel and place	0.58	VI

It was found that dose and techniques of input use, esp. seeds and fertilizers were highly diffused among farmers in the study areas, which was followed by varietal characteristics of different rice varieties, identification and control of pests and diseases, improved cultivation practices, irrigation and water management, marketing channels and lastly post-harvest handling was the least diffused one. As the respondents' most preferred need was the input use and management, similar information was found to be diffused by information sources, implying that information sources have somewhat addressed the needs of farmers regarding information dissemination.

**Information utilization behavior of farmers**

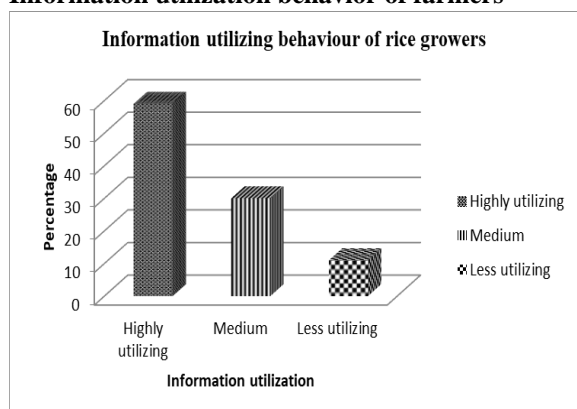


Fig 2. Information Utilization behavior of respondents

The above results showed that the technologies highly diffused by information sources appeared somewhat in line with the information need of the farmers. So, it was necessary to know to what extent the respondents utilized diffused information regarding technologies. Fig 2 is the result of the assessment of information utilization behavior of respondents done by categorizing respondents into high, medium and low utilizing groups.

It was found that about 59 percent of respondents were utilizing the information from information sources highly, while 30 percent and 11 percent were medium and low utilizing groups respectively. It was found that though information-seeking behavior was lower, however, the

respondents were found utilizing the information they received from information sources highly.

Table 5. Information utilization behavior of respondents

Information utilized	Mean score	S.D	Rank
Cultivation information	2.31	1.13	IV
Varieties information	2.55	1.44	III
Input management information	2.85	1.26	I
Market information	2.29	1.14	V
Climatic information	2.75	1.31	II

Table 5 shows the area of information most utilized by the respondents. Information related to input use and management (especially disease-pest identification and control) was utilized by most respondents; followed by climatic information, including the forecast of weather conditions. It was followed by improved varieties selection. Respondents knew about improved varieties of rice and their characteristics which allowed them to decide whether to adopt those varieties or not. Then, information about improved cultivation practices was utilized by farmers. Here, newer technologies and methods were disseminated by information sources to farmers and were perceived highly useful by them. Lastly, the market information was utilized. In contrast to information need related to market ranked third in need, it appeared in the last rank regarding information utilization. The main reason for this was found that the information sources covered negligible content about markets and marketing. Also, most farmers cultivated rice, primarily for home consumption and hence, the market information was least utilized by them.

**Information sharing by respondents**

The respondents were asked whether they had shared the information they accessed through the information sources. About 96 percent of respondents have shared the knowledge. The fellow farmers, relatives and other family members were the ones they shared information with. This suggests that information transfer was quite satisfactory in the study area.

### Preference of information sources based on their use and credibility

Table 6. Preferred Information Sources rank according to their use

Information Source	Mean Score	Rank
Broadcasting media (TV and Radio)	0.60	IV
Social Media and ICTs	0.42	VI
Printed Media	0.53	V
Fellow/Contact Farmers	0.88	I
Extension Personnel and agencies	0.83	II
Agro-vets and cooperatives	0.65	III

Table 6 highlights the use of information sources regarding the use of rice cultivation as perceived by farmers, with the majority of farmers agreeing that their fellow/contact farmers are the main source of getting new information regarding new varieties and technologies and were ranked 1st with a mean score of 0.88. This was followed by extension personnel and agencies in rank 2nd due to their facilitation, assistance and technical backstopping regarding issues related to rice cultivation with mean score 0.83. Agro vets and cooperatives were ranked 3rd with a mean score of 0.65. Broadcasting media like TV and Radio provided excellent information for farmers and was ranked at 4th followed by printed media in 5th (mean score 0.6 and 0.53 respectively) and the least utilized sources of information were social media with a mean score of 0.42. The analysis of information sources used by respondents showed that the informal sources were the major sources of information followed by formal sources. The use of more informal sources was because of high accessibility to and easy to interact with local sources of information. The study findings showed that few farmers utilized agricultural reading materials and social media as a source of knowledge. This might be caused by a lack of reading habits and/or lack of interest in the agricultural reading materials provided.

Source credibility operationally means a degree of trustworthiness and fairness according to a source of information by its user at a given time (Pokharel et al. 2015). The respondents were asked to rate the credibility of the information sources they have been using on the 5 point scale values of 1, 0.8, 0.6, 0.4 and 0.2 for most credible, much credible, credible,

less credible and least credible as perceived by them. The total score of each source was derived by the addition of all the values given by each respondent. The sources were ranked based on the total score.

Table 7. Information sources rank based on their credibility

Information Source	Mean Score	Rank
TV and Radio	0.66	IV
Social Media and ICTs	0.33	VI
Printed Media	0.63	V
Fellow/Contact Farmers	0.66	III
Extension Personnel and Agencies	0.87	I
Agro-vets and cooperatives	0.83	II

The data in Table 7 indicated that the extension agents were given maximum credibility followed by fellow farmers and radio and television, as information sources. It seems that informal sources and media are playing an important role in the sharing and delivery of information to the farmers. The least credible sources were printed material and social media.

Pokharel et al. (2015) also supported that fellow neighbors, extension agents and TV and radio were major sources of information for Nepalese farmers based on use and credibility.

### Satisfaction level of respondents in getting information from different sources

The satisfaction of an individual in the information getting process depends on the timely delivery of the required/desired information and the ease in understanding the information. The satisfaction level of rice growers in getting the desired/required information from different sources was studied and analyzed in three levels as highly satisfied, satisfied and dissatisfied respectively. The results of the satisfaction level of rice growers in the study area showed that the majority of the farmers were satisfied (about 73 %) followed by satisfied (about 21 %) and dissatisfied (6 %) in getting information from the different sources.

### Effectiveness of information sources as perceived by farmers

While the respondents perceived that enough information was delivered regarding inputs (seed,

fertilizers and pesticides), varieties and agronomic practices, however, it was comparatively inefficient in providing market, climate and post-harvest related information. Similarly, the respondents perceived that the relevancy of information was quite suited to their field condition. Regarding the ease in understanding the information delivered, the farmers felt that though the language was clear and the content was field-specific which helped in decision making, still the technical terms were a little hard to understand for them. However, the farmers were highly satisfied with project efforts except some respondents feeling incompetent to create their linkage with the information sources and felt behind in achieving appropriate information in time and need.

Based on this information, an effectiveness index was generated using parameters and formulae as mentioned above which is presented in Table 8.

Table 8. Information sources and their effectiveness index

Information Sources	Effectiveness Index
TV and Radio	0.66
Social Media and ICTs	0.59
Printed media	0.66
Fellow/Contact Farmers	0.81
Extension personnel and agencies	0.75
Agro-vets and cooperatives	0.78

The study revealed that fellow and contact farmers were highly effective in meeting the information needs of farmers with index value 0.81. The contact farmers, being the early majority groups play an important role in technology adoption and dissemination (Rogers 1995). A similar result was seen regarding information dissemination and it seemed that the farmers were quite reliable in information delivered by fellow farmers. Similarly, agro-vets and cooperatives along with extension personnel and agencies were also effective in delivering essential information to farmers at the time of need and were deemed effective by respondents with an index value of 0.78 and 0.75 respectively. Broadcasting media and printing media were perceived as comparatively less effective with index value 0.66. This might be because farmers were not able to catch up with appropriate time those media, esp. broadcasting media delivering relevant information to them. Regarding printed media, most farmers were less interested in reading printed media and consulted those media only at times of need and/or when other information sources could not

meet their needs. Social media and ICTs were perceived as the least effective. It might be because most farmers (household heads) were above 50 years age and they felt less comfortable in using those media.

#### **Correlation of information seeking and information utilizing behavior with different variables**

Table 9 depicted that there was a significant positive correlation between information variables and education, ethnicity, number of crops grown and access to information sources. It indicated that the farmer with higher education, growing more crops per year, and having easier access to information sources seek more information and utilize them in rice production. Similarly, the farmers of Brahmin/Chettri caste seem more interested in seeking and utilizing more information as compared to Indigenous and Dalits. As educated people are innovative and more prone to change, they get themselves exposed to different information sources. Thus, the rate of information seeking and utilizing behavior in them also appears to be high. A similar finding was found by Gunawardana and Sharma (2007), who reported that farmers with a higher level of education were seeking and utilizing more information on improved farm practices. Similarly, farmers' growing more crops need to deal with a diverse range of issues and problems. Thus, they tend to have higher information needs and explore and information sources to receive the desired information and solution to their issues. Also, higher access to information sources tends to make them explore more about improved technologies and persuade them to adopt them.

Also, the age of household head, family size and landholdings were non-significant to information variables. This means that these variables did not significantly influence the information seeking and utilizing the behavior of the farmers.

However, the experience of rice cultivation seemed non-significant to information-seeking behavior but was found significant to information utilization behavior. This means that though farmers may not seek information themselves, they might utilize the information they receive about rice cultivation.



Table 9: Relation between selected independent variables and information variables

Independent variables	Study variables	
	Information seeking	Information utilizing
Age of HHH	0.77NS	0.47NS
Education	0.22*	0.23**
Ethnicity	0.32*	0.74*
Family size	0.035NS	0.59NS
Years of rice cultivation	0.032NS	0.42*
Land holdings	0.039NS	0.075NS
No. of crops grown	0.21**	0.37**
Access to information sources	0.18**	0.52**

\*Significant at 5% level, \*\*Significant at 1 % level, NS: Non-significant

#### Information related problems in the study area

Also, the respondents were asked to point any three major problems regarding information accessibility and use in study areas, which was triangulated with the results obtained in FGD organized. It was found that the formal sources had problems of accessibility, especially extension personnel and agencies. Respondents were not able to reach extension agents in time of utmost need. Also, some extension personnel were of lower competence as perceived by them. Also, the broadcasting and telecasting time did not coincide with farmers' time and hence, most farmers were missing the information delivered through these media. Printed media relevant to the required topic/issue was difficult to get. Regarding the informal sources, the respondents felt that information was not quite reliable, complete and enough. Social media and ICTs faced the problem of network interruption.

Farmers perceived different problems in the efficient use of information in the actual field. The qualitative inputs (seed, fertilizers, pesticides) were not available in time. The marketing information such as wholesale price and quantity to be traded was more fluctuating and creating problems in developing a plan for production and marketing. Thus, special attention needs to be paid to these problems so that the information sources would be able to address the needs of the farmers effectively and the access and efficient use of the information by farmers would solve the problems of production and benefit them.

## CONCLUSION

It can thus be concluded that the farmers with a higher level of education, higher ethnicity, growing more crops and having easier access to different information sources were seeking and utilizing more information in rice production in western midhills. The farmers sought and utilized input management (seed, fertilizer, pesticide, labor) and climatic information the most. Market information was also sought satisfactorily but was least utilized of all. For these information, farmers were relying mainly on informal information sources (fellow and contact farmers) followed by other formal sources like extension agencies and agro-vets and cooperatives. However, they felt that extension agencies and agro-vets gave more credible information. Though information seeking behavior was found high only on 30% respondents, however, the information utilization percent was quite higher (about 60 %), implying that most farmers, though not seeking information themselves, were utilizing the information they received. The analysis of the effectiveness of different information sources in meeting the information needs of farmers showed that fellow/contact farmers, extension personnel, agro vets and cooperatives were quite effective while social media and ICTs were least effective. In the present digitalized world, the less effectiveness of social media and ICTs in meeting the information needs of farmers is a real issue that should be addressed because the role of ICTs and social media in helping farmers get appropriate information and services to increase agricultural productivity is increasing day by day. So, it should be prioritized in the study area too. For this, informal training regarding ICTs and social media use in agriculture needs to be promoted in study areas to make farmers more comfortable towards these media.

Also, the timely accessibility to extension agents, perceived as a major problem by respondents, could be improved if the social media and ICT use could be promoted in the study area. The printed media also needs to increase its availability covering issues of farmers' need to increase its effectiveness. The competency of extension personnel needs to be increased by respective extension institutions and agencies so that they can deliver effective service to the farming community. Also, a separate information

delivery system could be designed comprising these information sources which would address the farm level problems of farmers according to their needs and favorable time, which would ultimately increase farmers' access to first-hand scientific information regarding agricultural practices.

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### REFERENCES

- Adio, E.O., Abu, Y., Yusuf, S.K. & Nansoh, S. (2016). Use of Agricultural Information Sources and Services by Farmers for Improve Productivity in Kwara State. Library Philosophy and Practice (e-journal). Available at: <http://digitalcommons.unl.edu/libphilprac/1456>. Assessed on 11<sup>th</sup> May, 2020.
- Aina, L.O. (2008) Information for Successful Agriculture. World Librarie, 2(1). Available at: [http://www.lib.org/Vol\\_ozonol/airaVol\\_2n1.shtml](http://www.lib.org/Vol_ozonol/airaVol_2n1.shtml). Accessed on 14<sup>th</sup> May, 2020.
- Baral, P. (2018). Effectiveness of the Extension Methods: A Case in Western Midhills of Nepal. M. Sc. Ag. Dissertation. Institute of Agriculture and Animal Science, Tribhuwan University. Nepal.
- Baral, P., Paudel, R., Adhikari, B.B., Subedi, M. & Jaishi, M. (2018). Effectiveness of the Extension Methods: A Case in Western Midhills of Nepal. Journal of Institute of Agriculture and Animal Science, 35(1): 47-57.
- CBS. (2011). National Living Standard Survey 2010/11, Report, Central Bureau of Statistics, National Planning Commission, Kathmandu.
- CBS. (2016). Annual Household Survey. Report, Central Bureau of Statistics, National Planning Commission, Kathmandu.
- FAO. (2010). The state of food insecurity in the world: addressing food insecurity in protracted crises, Research Report by Food and agricultural Organization, Rome.
- Gunawardana, A.M. & Sharma, V.P. (2007). Personal characteristics of farmers affecting the information seeking behaviour on improved agricultural practices in Udaipur District, Rajasthan, India. Tropical Agricultural Research, 19: 359-366.
- IRRI. (2009). Annual Report of IRRI. *GAPs fill gap*. Los Banos, Laguna, Philippines.
- Kafle, B., Paudel, M.N. & Ghimire, R.C. (2012). Assessing current status of early rice varieties in river Basin area of Nepal: a concern to diffusion. International Journal of Agriculture: Research and Review, 2(2). 59-61.
- Koyenikan, M.J. (2011) Extension Workers' Access to Climate Information and Sources in Edo State, Nigeria Scholars Research Library Archives of applied science research. 3(4): 11-20.
- Maru, A. & Pesce, V. (2008). Adoption of Information and Communications Technologies in Agricultural Research for Development. Available at: [http://www.fao.org/docs/eims/upload/248898/Maru\\_paper ICT adoption.pdf](http://www.fao.org/docs/eims/upload/248898/Maru_paper ICT adoption.pdf). Accessed on 15th May, 2020.
- MoAD. (2017). Krishi Diary, 2017. Published by: Agriculture Information and Communication Center, Ministry of Agriculture Development. Government of Nepal. Hariharbhawan, Lalitpur.
- MOALC. (2015). Statistical information on Nepalese Agriculture. Monitoring, Evaluation and Statistics Divisio Agri Statistics Section, Ministry of Agriculture, Land and Cooperatives. Singh Durbar, Kathmandu.
- Neuman, W.L. (2000). Social research methods: Qualitative and Quantitative Approaches. 4th Edition, Allyn and Bacon, Needham Heights.
- NPC. (2007). Three Year Interim Plan (2008- 2010). National Planning Commission, Nepal. 458 p.
- Nzully, H.J. (2007). Evaluation of the Effectiveness of KATC Approaches in Improving Smallholders' Irrigated Rice Productivity: A Case of Selected Irrigation Schemes in Tanzania. Master of Science in Agricultural Education and Extension. Dissertation. Sokoine University of Agriculture. Morogoro, Tanzania.
- Pezeshki-Rad, G. & Zamani, N. (2005). Information seeking behavior of Iranian extension managers and specialist. IR Information Research. 1:3. Available at: [www.informationr.net/ir/0-3/papers229.html](http://www.informationr.net/ir/0-3/papers229.html). Retrieved on May, 2020.
- Pokharel, N.K., Tiwary, S.N., Devkota, N.R. & Devkota, D. (2015). Information Seeking and Utilization Behavior of Commercial Vegetable Farmers of Chitwan and Dhading

- Districts of Nepal. *Agriculture Development Journal*. 11(1).
- Rogers, E.M. (1995). *Diffusion of innovations*. 4th Edition. The Free Press Publishers. New York, USA: 519.
- Tadesse, D. (2008) *Access and Utilization Agricultural Information by Resettler Farming Household: the Case of MetemaWoreda, North Gender, Ethopia*
- Tripathi, B. (2013). Knowledge management tools of rice technology in Nepal. *Agronomy Journal of Nepal*.
- Wilson, T.D. (2000). Human information behaviour. *Informing science*. 3:2: 49-55.

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