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Information-Seeking Behaviour of Registered Apple Fruit Growers: Ranking of Sources of Information Used in Apple Marketing in Sopore Fruit Mandi, Kashmir

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Abstract

Timely and reliable market information is central to a fruit grower's ability to negotiate prices, time sales and adopt recommended marketing practices. This study examined the sources of information used by registered apple fruit growers marketing their produce through Sopore fruit mandi, Baramulla district, Kashmir. Data was collected from a random sample of 150 registered growers using a pre-tested interview schedule, and the frequency and percentage of growers availing each of twelve identified sources were computed and ranked. Radio emerged as the most widely used source (92.00%, Rank I), followed by television (72.66%, Rank II), the Horticulture Development Officer (69.33%, Rank III), the Area Marketing Officer (60.00%, Rank IV) and neighbours (43.33%, Rank V). Krishi Vigyan Kendra, ICT tools/mobile advisory services, Kisan Melas, progressive farmers, newspapers, farmer's friends and university scientists followed in descending order of utilization, with university scientists being the least-used source (10.66%, Rank XII). The predominance of mass-media and local-official sources over formal scientific channels highlights an opportunity to strengthen last-mile linkages between research institutions and growers through the very channels growers already trust.

***Key words*:** Sources of information, Apple marketing, Registered fruit growers, Extension communication, Sopore mandi

Apple (*Malus domestica* Borkh.) is the most important temperate fruit crop cultivated in the Himalayan region of India and constitutes the backbone of the horticultural economy of Jammu and Kashmir. The Union Territory contributes nearly three-fourths of the country's total apple production and provides direct and indirect employment to a large segment of the rural population through cultivation, harvesting, grading, packaging, transportation, storage, and marketing activities [1-2]. Apple cultivation has emerged not only as a profitable enterprise for farm households but also as a major contributor to regional income, livelihood security, and agricultural diversification. Among the major apple-producing districts of Kashmir, Baramulla district, particularly Sopore, occupies a prominent position owing to its large area under apple cultivation and the presence of one of Asia's largest fruit Mandis. The Sopore Fruit Mandi serves as the principal marketing hub for apple growers across North Kashmir and facilitates the movement of fresh apples to domestic as well as international markets. Although remarkable progress has been achieved in increasing apple production through the adoption of improved cultivars, scientific orchard management, and better post-harvest practices, marketing continues to be one of the most critical determinants of growers' profitability. Unlike annual field crops, apples are highly perishable and require efficient post-harvest handling, grading, packaging, storage, transportation, and market intelligence to ensure remunerative prices. The complexity of apple marketing has further increased due to fluctuations in market prices, changing consumer preferences, competition from imported fruits, rising transportation costs, and increasing quality standards in domestic and export markets [3]. Consequently, successful apple cultivation today depends not only on production efficiency but equally on informed marketing decisions.

In Jammu and Kashmir, apple marketing is predominantly carried out through the private marketing system involving pre-harvest contractors, commission agents, forwarding agents, wholesalers, retailers, and private traders. While this marketing structure provides extensive market linkages, it also creates information asymmetry between growers and market intermediaries. Numerous studies have reported that many apple growers remain largely production-oriented and possess comparatively limited knowledge regarding market trends, grading standards, quality specifications, storage facilities, transportation logistics, price forecasting, and alternative marketing channels [4-6]. Such information gaps often reduce growers' bargaining power and

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may compel them to sell their produce under less favourable market conditions, ultimately affecting farm income and marketing efficiency.

Information has therefore become one of the most valuable resources in modern horticultural marketing. Timely, reliable, and relevant information enables growers to make informed decisions regarding harvesting schedules, grading, packaging, storage, transportation, selection of markets, negotiation with intermediaries, and timing of sale. Effective dissemination of market information also reduces uncertainty, minimizes transaction costs, improves market transparency, and enhances producers' share in consumers' expenditure. Consequently, strengthening agricultural information systems has become an important component of horticultural development programmes and agricultural extension services. The information environment available to apple growers has diversified considerably over the past few decades. Traditional interpersonal sources such as neighbours, relatives, experienced orchardists, progressive farmers, local traders, and commission agents continue to influence growers' marketing decisions because of their accessibility, familiarity, and practical experience. Simultaneously, institutional sources including Horticulture Development Officers, Area Marketing Officers, scientists of Sher-e-Kashmir University of Agricultural Sciences and Technology (SKUAST), Krishi Vigyan Kendras (KVKs), extension personnel, and cooperative organizations provide scientifically validated recommendations and market-related guidance. In addition, mass media such as radio, television, newspapers, farm magazines, and digital information and communication technologies (ICTs), including mobile phones, internet-based advisory services, social media platforms, and agricultural applications, have substantially expanded the opportunities for rapid dissemination of market information. The importance of different communication channels in influencing farmers' knowledge and decision-making has been widely documented in agricultural extension research. Early investigations by Wilkening [7] demonstrated the significant contribution of interpersonal communication in the diffusion of agricultural innovations. Subsequently, Ryan and Rogers [8] and Rogers [9] emphasized that adoption behaviour is strongly influenced by the interaction of interpersonal networks with formal extension systems. Studies by Nagokey [10] identified radio as one of the earliest and most influential mass media sources for agricultural information dissemination, while Agrawal and Roy [11] reported television as an increasingly effective medium because of its visual demonstration capability and wide household reach. Similarly, Ahmad Hussain [12] and Ganorkar and Khonde [13] highlighted the critical role played by extension personnel and institutional agencies in transferring agricultural technologies and improving farmers' decision-making capacity through direct contact.

Despite the availability of multiple information sources, growers differ considerably in the frequency with which they access various channels and the level of trust they place in them. Information-seeking behaviour is influenced by socio-economic characteristics, educational status, farming experience, access to extension services, market orientation, communication exposure, and the perceived credibility of different information sources [14]. Identifying the channels that growers actually use for obtaining marketing information is therefore essential for improving the effectiveness of extension programmes and designing communication strategies that correspond with farmers' preferences. Extension interventions are more likely to succeed when they utilize information channels that are already trusted and regularly consulted by growers rather than relying solely on formal institutional mechanisms [15]. In the context of Kashmir's apple industry, relatively limited empirical evidence is available on the information-seeking behaviour of registered apple growers specifically with respect to marketing decisions. Most previous studies have focused on production practices, economic analysis, marketing efficiency, or investment returns, while comparatively little attention has been given to understanding the hierarchy of information sources used by growers during marketing operations. Considering the increasing importance of market intelligence under competitive horticultural markets, there is a need to systematically examine the relative importance of interpersonal, institutional, and mass media sources in supporting apple marketing decisions. Keeping this background in view, the present investigation entitled "Information-Seeking Behaviour of Registered Apple Fruit Growers: Ranking of Sources of Information Used in Apple Marketing in Sopore Fruit Mandi, Kashmir" was undertaken to identify and rank the various sources of information utilized by registered apple fruit growers for marketing-related decision-making. The findings are expected to provide valuable insights for policymakers, extension agencies, horticultural departments, market authorities, and researchers in strengthening market-oriented extension services and developing effective communication strategies for enhancing the marketing efficiency and profitability of apple growers in Kashmir.

MATERIALS AND METHODS

The present investigation was conducted during October–November 2015 at the Sopore Fruit Mandi, located in Baramulla district of North Kashmir, Jammu and Kashmir, India, which is recognized as one of the largest fruit marketing centres in Asia and serves as the principal marketing hub for apple growers of the Kashmir Valley. An ex post facto research design was adopted as the study sought to assess the existing information-seeking behaviour of apple growers without manipulating any of the study variables. The target population comprised all registered apple fruit growers associated with the Fruit Growers' Association of Sopore Fruit Mandi. A simple random sampling technique was employed to ensure equal representation of respondents, and a sample of 150 registered apple fruit growers, constituting approximately 20 per cent of the total registered growers, was selected from the official membership list maintained by the Fruit Growers' Association. Primary data were collected through personal interviews using a structured and pre-tested interview schedule specifically developed for the study. The schedule included questions pertaining to the utilization of twelve major sources of marketing information, namely radio, television, Horticulture Development Officer (HDO), Area Marketing Officer (AMO), neighbours, Krishi Vigyan Kendra (KVK), Information and Communication Technology (ICT) tools/mobile advisory services, Kisan Melas, progressive farmers, newspapers, farmer's friends, and university scientists. Respondents were asked to indicate whether they used each source for obtaining information related to apple marketing, including price information, grading, packaging, transportation, storage, and other marketing decisions. The collected data were carefully edited, coded, classified, and tabulated for statistical analysis. Descriptive statistical techniques, including frequency and percentage, were employed to quantify the extent of utilization of each information source. The various information sources were subsequently ranked in descending order based on the percentage of respondents reporting their use, thereby

identifying the most preferred and widely utilized channels for obtaining apple marketing information among registered apple growers of Sopore Fruit Mandi. This methodological approach provided a comprehensive understanding of growers' information-seeking behaviour and facilitated the prioritization of communication channels for strengthening market-oriented extension services in the study area.

RESULTS AND DISCUSSION

The utilization pattern of different information sources by the registered apple fruit growers is presented in (Table 1, Fig 1). The findings reveal considerable variation in the extent to which growers relied upon different communication channels for obtaining information related to apple marketing. The results indicate that the respondents depended more on easily accessible and familiar information sources, while comparatively less preference was given to formal scientific institutions and specialized advisory services. The ranking of the twelve identified sources clearly demonstrates that mass media and frontline extension personnel continue to dominate the information system of apple growers in the study area.

Among all the information sources, radio emerged as the most frequently utilized source, with 138 respondents (92.00%) reporting its use, thereby securing Rank I. The predominance of radio may be attributed to its widespread household availability, low operational cost, portability, ease of access even in remote hilly areas, and the regular broadcast of agricultural and market-related programmes in regional languages. Radio remains an effective medium for disseminating timely information on prevailing market prices, weather forecasts, transportation, harvesting schedules, and government advisories, enabling growers to make informed marketing decisions. Despite rapid advancements in digital communication technologies, radio continues to enjoy high credibility among rural farming communities because of its simplicity and uninterrupted accessibility. The present findings corroborate the observations of Nagokey [10], who identified radio as one of the earliest and most influential mass communication channels for agricultural information dissemination due to its extensive rural coverage and affordability.

Television ranked second, being utilized by 109 respondents (72.66%). The relatively high utilization of television indicates that visual media have become an important source of agricultural knowledge among apple growers. Television programmes broadcast by government agencies and agricultural institutions provide demonstrations on grading, packaging, post-harvest management, storage technologies, and prevailing market conditions, thereby improving growers' awareness regarding scientific marketing practices. The audio-visual nature of television enhances comprehension and retention of information compared with purely audio media, making it particularly useful for demonstrating improved horticultural technologies. The findings are in agreement with Agrawal and Roy [11], who reported television as an effective communication medium capable of influencing farmers' knowledge and adoption behaviour through visual learning.

Among the institutional sources, the Horticulture Development Officer (HDO) occupied the third position, with 69.33 per cent of the growers seeking information from this source. This high level of utilization reflects the confidence of apple growers in the technical competence and field-level accessibility of horticultural extension personnel. HDOs regularly interact with orchardists regarding orchard management, disease and pest management, grading, packaging standards, and government support programmes, thereby becoming trusted advisors for marketing-related decisions. Similarly, the Area Marketing Officer (AMO) was utilized by 60.00 per cent of the respondents and ranked fourth. Area Marketing Officers serve as an important institutional link between producers and regulated markets by providing guidance on market arrivals, price trends, grading standards, transportation, and marketing regulations. The relatively high ranking of both HDOs and AMOs demonstrates that institutional extension services continue to play a significant role in strengthening market-oriented decision-making among apple growers. These findings are consistent with those reported by Ganorkar and Khonde [13] and Rao and Patel [16], who emphasized that extension personnel significantly influence farmers' adoption of recommended agricultural and marketing practices through regular field contacts and technical guidance.

Neighbours constituted the fifth most important source of information, being consulted by 43.33 per cent of the respondents. The moderate dependence on neighbours highlights the continuing importance of interpersonal communication within farming communities. Farmers frequently exchange experiences regarding market prices, transportation arrangements, storage availability, grading practices, and buyers through informal discussions, thereby reducing uncertainty associated with marketing decisions. Such interpersonal interactions are often perceived as trustworthy because they originate from individuals facing similar production and marketing conditions. The present findings support the classical diffusion studies of Wilkening [7], who recognized neighbours as influential opinion leaders in the dissemination of agricultural innovations and farm-related information.

The Krishi Vigyan Kendra (KVK) was reported as an information source by 40.00 per cent of the respondents and secured Rank VI. KVKs organize training programmes, demonstrations, field days, and awareness campaigns covering various aspects of horticultural production and marketing. Their moderate utilization indicates that while they are recognized as credible technical institutions, their outreach among registered apple growers could be strengthened further through increased frequency of farmer trainings, exposure visits, and market-oriented extension programmes [17].

The growing influence of digital communication is evident from the finding that ICT tools and mobile advisory services were utilized by 36.66 per cent of the respondents, ranking seventh among all information sources. Although the proportion remains lower than traditional mass media and extension personnel, it indicates the gradual integration of digital technologies into agricultural marketing. Mobile phones, internet-based advisory services, social media platforms, and digital messaging applications provide quick access to market prices, weather updates, pest alerts, and advisory services. Increasing smartphone penetration and improved internet connectivity in rural Kashmir have likely contributed to the adoption of ICT-based information systems. However, limited digital literacy, inconsistent internet connectivity in remote areas, and varying levels of trust in online information may still restrict their wider utilization. The findings are in conformity with the Diffusion of Innovations Theory proposed by Rogers [9], which suggests that adoption of new communication technologies progresses gradually as awareness, accessibility, compatibility, and perceived usefulness increase among potential users.

Kisan Melas ranked eighth, with 36.00 per cent of the respondents reporting participation. Agricultural fairs provide opportunities for growers to interact directly with scientists,

extension officers, input suppliers, and successful farmers while simultaneously observing demonstrations of improved technologies and marketing innovations. Although attendance at such events is periodic rather than continuous, they remain valuable platforms for acquiring comprehensive knowledge on production and marketing practices. Similar observations have been reported by Deshpande [18], who highlighted the educational value of agricultural exhibitions and fairs in enhancing farmers' awareness and technology adoption.

Progressive farmers occupied the ninth rank, being consulted by 33.33 per cent of the respondents. Progressive farmers often function as local opinion leaders who influence neighbouring growers through their practical experience and successful adoption of improved technologies. Their recommendations are frequently regarded as reliable because they are demonstrated under local agro-climatic conditions. Nevertheless, their influence was comparatively lower than that of institutional sources, suggesting that growers increasingly seek technically validated information alongside experiential knowledge. These findings correspond with those reported by Campriot and Intodia [19], who identified progressive farmers as important informal sources of agricultural information within rural communities.

Among the least preferred information sources, newspapers were utilized by only 22.00 per cent of the respondents and ranked tenth. The comparatively low dependence on newspapers may be attributed to varying literacy levels among growers, delayed dissemination of market information compared with electronic media, and limited publication of localized market intelligence. Nevertheless, newspapers continue to provide useful information on government policies, export opportunities, market arrivals, and horticultural developments for educated growers. Similar findings were reported by Ryan and Rogers [8], who observed that the effectiveness of print media is largely influenced by farmers' educational background and reading habits.

Table 1 Ranking of various sources of information used by registered apple fruit growers (N = 150)

S. No.	Source of Information	Frequency	Percentage	Rank
1.	Radio	138	92.00	I
2.	Television	109	72.66	II
3.	Horticulture Development Officer	104	69.33	III
4.	Area Marketing Officer	90	60.00	IV
5.	Neighbour	71	43.33	V
6.	Krishi Vigyan Kendra	60	40.00	VI
7.	ICT tools / mobile advisory services	55	36.66	VII
8.	Kisan Mela	54	36.00	VIII
9.	Progressive Farmer	50	33.33	IX
10.	Newspaper	33	22.00	X

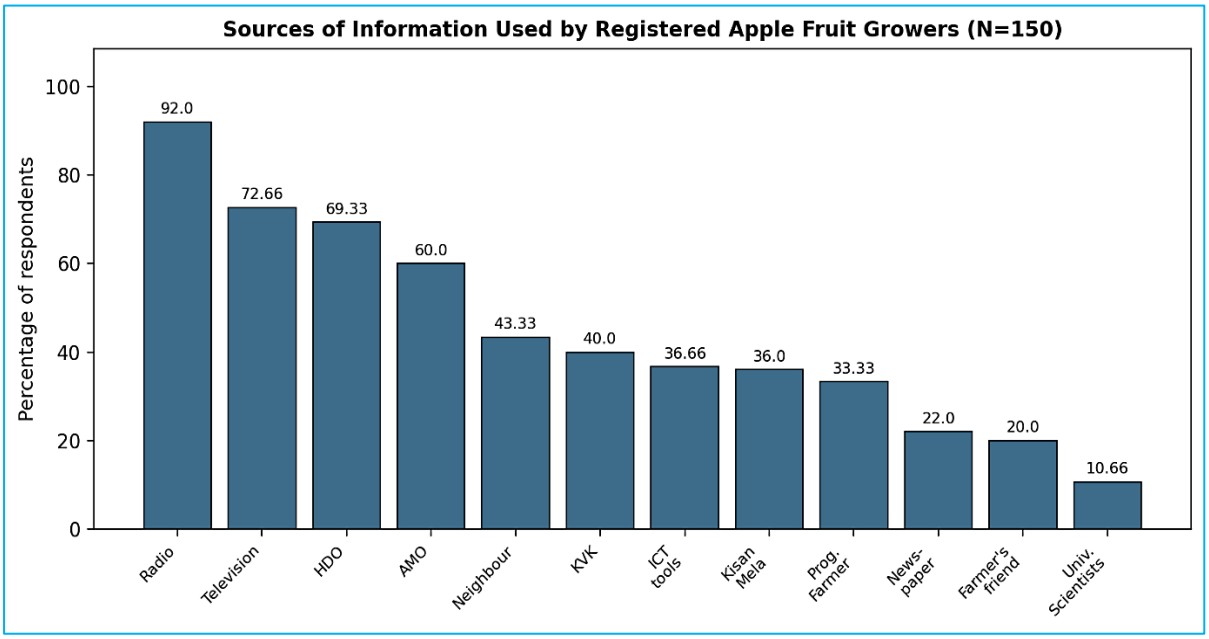

Fig 1 Percentage of registered apple fruit growers availing different sources of information

Farmer's friends ranked eleventh, being utilized by 20.00 per cent of the respondents. Although this informal communication channel exhibited relatively limited use, interactions with trusted acquaintances still contributed positively to information exchange regarding marketing opportunities and practical experiences. The lower ranking may reflect growers' preference for obtaining marketing information directly from official extension agencies or electronic media. Comparable observations have been made by Yogananda [20], who reported that farmer-to-farmer communication serves primarily as a supplementary rather than primary source of agricultural information.

The least utilized information source was university scientists, consulted by only 16 respondents (10.66%), thereby securing Rank XII. The limited interaction between growers and university scientists may be attributed to geographical distance from research institutions, inadequate opportunities for direct contact, limited extension outreach, and the predominance of intermediary extension agencies that often bridge the gap between research and farming communities.

Nevertheless, university scientists remain one of the most credible sources of scientifically validated information, and their expertise has considerable potential to improve market-oriented production practices if effective mechanisms for direct farmer-scientist interaction are strengthened. The findings agree with Raghavendra [21], who observed that although relatively few farmers directly consult university scientists, those who do highly value the quality and reliability of the information received.

The findings indicate that the information-seeking behaviour of registered apple fruit growers in Sopore Fruit Mandi is characterized by a balanced dependence on traditional mass media, frontline extension personnel, and interpersonal communication networks, while digital advisory services are gradually emerging as important supplementary information channels. The predominance of radio, television, Horticulture Development Officers, and Area Marketing Officers suggests that extension agencies should continue utilizing these well-established communication channels for disseminating market intelligence. Simultaneously, greater emphasis should be placed on expanding ICT-based advisory systems, strengthening Krishi Vigyan Kendra outreach, promoting farmer-scientist interactions, and enhancing the visibility of university extension services to facilitate faster dissemination of reliable market information. Such an integrated communication strategy would improve the marketing competence of apple growers, reduce information asymmetry, enhance bargaining power, and ultimately contribute to higher farm income and greater efficiency in the apple marketing system of Kashmir.

CONCLUSION

Registered apple fruit growers of Sopore fruit mandi rely predominantly on mass media radio and television supplemented substantially by institutional extension functionaries (Horticulture Development Officer, Area Marketing Officer), while formal scientific sources such as university scientists remain the least utilized. Strengthening the market-information content carried on radio and television, and improving the frequency and reach of extension-officer contact, would align delivery with growers' existing information-seeking habits; simultaneously, deliberate efforts to bring university and Krishi Vigyan Kendra (KVK) expertise closer to growers including via the ICT/mobile channels that are already gaining traction could help close the currently under-exploited link between formal research and field-level marketing decisions.

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