



Development of e booklet for apple growers: A study in Garhwal region of Uttarakhand

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ABSTRACT

Uttarakhand rank third in the country in production of Apple and produces 57,753.49 metric tonnes of apples annual. Majority of apple growers are categorized under medium to low socio- economic status because of the constraints faced by them. The extension worker and farmers ratio are quite less and shows a huge information gap. As a result, there is a need for alternatives that can bridge the information gap. This is ICTs era and there are various media available such as print and electronic which can be utilized to bridge the information gap. Out of all these media, e-booklet an electronic form of a small size book and gives us information about a certain subject was used for this study. Present study was conducted in the Uttarkashi district of Uttarakhand. Four villages namely *Harsil, Jhala, Sukhi* and *Dharali* were selected randomly from the *Bhatwari* block. A total sample of 120 respondents was selected by PPS sampling method. Pre and post experimental research design was used. Data collection was done by using a pre-tested structured interview schedule and knowledge test. Split Half method and Content validity was used for knowledge test. The finding of the present study indicated that majority of the respondents (72.5%) belonged to middle age group, had education upto intermediate level (32.5%) and had medium family size (92.5%), were in medium annual income (67%), having medium size of apple orchard (65%), ten to thirteen year of experience in apple farming (44.16%), medium information seeking behaviour (59.16%), medium risk orientation (69.17%), owned mobile with internet (100%), have medium mass media exposure (65.84%). All the respondents (100%) needed information regarding plant protection measures. Based on information needs an e-booklet was designed. Regarding the design, name, content, utility, accuracy, clarity, readability, need-based information and overall look found most satisfactory by most respondents. The mean gain in knowledge score of respondents was significantly higher in post-test than in the pre-test. It was found that the e booklet for apple growers was significantly effective in terms of gain in knowledge.

Key words: Apple growers, e-booklet, effectiveness, information gap

India is the second-largest producer of fruits and vegetables in the World. (APEDA, 2020). About more than 50 per cent of India's population lived in the villages and agriculture is their primary source of food, fodder and fuel as well as income. (FAO, 2017) Fruit growing is one of the important and age-old professions practiced in India since ancient times. Among the fruit crops, apple is one of the major temperate horticultural crop produced in India. The farmers of Uttarakhand are purely dependent on farming as their source of income. (Wani *et.al*, 2021). Apple accounts for 17 per cent of the total area under fruit crop production in the State and 13 per cent of the total fruit production. (Upadhaya *et, al.* 2022). In Uttarakhand Uttarkashi and Almora are the two major districts with the highest production of apple. (State Horticulture Mission, 2020). Uttarakhand ranks third in the country in the production of Apple (0.62 lakh MT) after Jammu & Kashmir (13.68 lakh MT) and Himachal

Pradesh (6.25 lakh MT). (District Census Handbook Uttarkashi, 2020). Major problems faced by apple growers in the Garhwal region in production of quality of fruits were lack of technical know how, vertical and management practices. The extension worker and farmers ratio are 1:1156 which is quite less and shows a huge gap. (Sharma, 2014) This is one of the reason behind the knowledge gap exists among the farmers. To fill this gap and to deliver information easily and effectively e-booklet can be considered as a good extension tool that has emerged out of the digitalization and communication revolution. (Dudi, 2010) This is one of way through the gap that exists between extension workers and farmers will be reduced. Thus, present research investigation was designed with the objectives to study the socio-economic, communication, and psychological characteristics of apple growers, to assess the information needs of apple growers and to design an e-booklet and to assess the effectiveness of e-Booklet in terms of knowledge gain by apple growers.

MATERIALS AND METHODS

The Pre and post experimental research design was used to meet the objectives of the study. The study purposively carried out in Uttarkashi district of Uttarakhand in the year 2020-21. Four villages namely *Harsil*, *Jhala*, *Sukhi* and *Dharali* were selected randomly from the *Bhatwari* block. A total sample of 120 respondents was selected by PPS sampling method. Data collection was done by using a pre-tested structured interview schedule and knowledge test. Interview schedule was divided into two parts viz; general information and information needs. The information needs of the apple grower were assessed on a three-point continuum i.e. most needed, needed, and not needed with the scores of 3, 2, 1 respectively. The responses were taken for ten key areas which were further divided into sub-areas. The respondent was asked to select any of the three from most needed, needed, and not needed according to their prior information in the given practices. The frequencies and percentages for each item were calculated and ranked accordingly. The prioritized areas as per rankings were considered for designing and developing messages. After need assessment knowledge test was administered. A knowledge test was developed to measure the knowledge of respondents on apple cultivation and responses were quantified by giving a score of 'one' for correct answer and 'zero' for wrong answer. Validity and reliability were essential for a sound knowledge test. Content validity of the tool was tested by sending the schedule to fruit science expert and suggestions of experts were incorporated. Reliability was measured through Split Half Method. Spearman-Brown prophesy formula was used to measure reliability. After that Gain in knowledge was measured. Gain in Knowledge is the extent of information gained by the apple growers on various practices after exposure to e-booklet. Any pre-test and post-test change in the cognitive learning behavior of the respondents leads to knowledge gain. A total score of pre-test and post-test was determined and later to it the difference of mean score of post-test exposure test to mean score of pre-test exposure was taken which gives final finding i.e., gain in knowledge. Paired t-test was also used to test the significance.

RESULTS AND DISCUSSION

Socio-economic and Communication characteristics of Apple Growers: Table 1 depicts about the general information of apple growers. The study revealed that majority (72.5%) of the respondents were in the middle age category followed by 15.83 per cent in the old age group and 11.66 per cent in the young age group. This finding shows that majority of the respondents were quite matured age-wise and still engaged in farming. Maximum percentage of the respondents (32.5%) had education up to intermediate followed by high school (25.0%). Further, 20.0 per cent of the respondents were educated up to middle school followed by graduate and above (11.66%) and 10.83 per cent of respondents were educated upto primary school. Majority of the respondents (92.5%) had medium family size followed by 7.5 per cent of respondents had small family size. Majority of the (67.5%) respondents was in the medium annual income category followed by 25.83 per cent of respondents were earning low annual income whereas 6.66 per cent of the respondents were found to be in the high annual income category. It can be concluded that apple growers have adopted apple cultivation along with traditional farming but their income is at a moderate level that might have motivated the respondents to go for apple cultivation as an additional source of generating income along with farming. It is evident from table 1 that the majority of the respondents (65.00%) had a medium size of apple orchard farmers followed by 19.16 per cent large size of apple orchard and 15.84 per cent the small size of apple orchard. It is the reason for such distribution may have to the fact in hilly region size of landholding is fragmented and small. So, most of the

apple growers had 1.45 acre or small landholding size. Smallholding size may be one of the factors that have motivated to adopt of apple farming. The study conducted by Sharma (2013) reported similar findings.

Table 1: Distribution of respondents according to socio-economic characteristics (n=120)

Categories	Frequency	Percentage
Age		
Young age (upto 36 years)	14	11.66
Middle age (36 to 57 years)	87	72.5
Old age (more than 57 years)	19	15.83
Education		
Primary school	13	10.83
Middle school	24	20.0
High school	30	25.0
Intermediate	39	32.5
Graduate and above	14	11.66
Primary school	13	10.83
Middle school	24	20.0
Family type		
Small	9	7.5
Medium	111	92.5
Annual Income		
Low (< ₹1, 08,650)	31	25.83
Medium (₹1,08,650 to ₹1,51,300)	81	67.5
High (> ₹ 1,51,300)	8	6.66
Size of apple orchard		
Small farmers (<0.70 acres)	19	15.84
Medium farmers (0.70 to 1.45 acres)	78	65.00
Large farmers (>1.45acres)	23	19.16
Farming Experience		
Less than 10 years	4	3.33
10 - 13 years	53	44.16
13 – 19 years	37	43.3
19 – 22 years	15	21.6
More than 22 years	17	14.16
Information seeking behavior		
Low	27	22.50
Medium	71	59.16
High	22	18.34
Risk orientation		
Low	15	12.50
Medium	83	69.17
High	22	18.33
Mass Media Exposure		
Low	19	15.83
Medium	79	65.84
High	22	18.33

Maximum percentage of the respondents (44.16%) were found to have 10 to 13 years' experience in apple farming followed by 43.3 per cent of respondents were found to have 13 to 19 years' experience in apple farming, 21.6 per cent of respondents were found to have 19 to 22 years' experience in apple farming, 14.16 per

cent of respondents were found to have more than 22 years' experience in apple farming and only 3.33 per cent of respondents were found to have less than 10 years' experience in apple farming. It can be concluded that the majority of respondents were found practicing apple cultivation for about 10-13 years that depicts respondents might have started apple farming at an early age. Most of the respondents (59.16%) had medium level of information seeking behaviour followed by 22.50 per cent of those who had low level of information seeking behaviour and 18.34 per cent of the respondents had high level of information seeking behaviour. The findings of the present study are similar to Raghuwanshi (2015) who mentioned that the majority of the respondents had medium level of information seeking information. Majority of the respondents (69.17%) had a medium level of risk orientation category followed by 18.33 per cent having a high level of risk orientation and 12.50 per cent had a low level of risk orientation. The reason for such distribution may be that the majority of the apple growers had a medium level of information source utilization and information is one of the main factors that govern the individual orientation i.e., risk orientation the majority was found to belonging to medium risk orientation. The findings of the present study are similar to Rathwa (2013) who had reported that the majority of the respondents had a medium level of risk orientation. Majority of the respondents (100%) owned Smartphone with internet followed by 96.6 per cent of respondents owned television, 46.67 per cent of respondents owned newspaper, 19.16 per cent of respondents had owned farm magazine.

Information needs of apple growers: Information has emerged as a critical factor in farming. It helps the farmers to make wise decisions about innovative cultivation practices and the application of Agri-inputs. These are often referred to as agriculture information needs. However, specific information needs expressed by apple growers regarding the cultivation of apples was the focus of the study. Data regarding the information needs are presented in the table 2 which indicates that plant protection measures information needs were of prime importance for the apple growers with the rank I, followed by fertilizer application and management information needs. Training and pruning was ranked IV based on the responses which were followed by rank V for variety and rank VI for weed management practices. Land preparation and planting was ranked VII based on the responses which were followed by rank VIII for harvesting and post harvesting methods and rank IX for supporting facts.

Table 2: Distribution of the respondents according to Information needs related to apple growers (n=120)

Information needs	Weighted mean score	Rank
Varieties of Apple	2.00	V
Land preparation and planting needed	1.82	VIII
Weed management practices for Apple	1.90	VII
Fertilizer application and management practices	2.08	II
Plant protection measures	2.09	I
Marketing facilities	2.06	III
Harvesting and post-harvesting methods	1.94	VI
Training and pruning	2.04	IV
Supporting facts related to apple production	1.67	IX

Design an e-booklet for apple growers: Based on need assessment data, an e-booklet was developed on apple cultivation. For developing e-booklet literature was reviewed from textbooks, research, internet, thesis, magazine, and consultation with a subject specialist. Therefore, the e-booklet was designed entitled "*Seb Ki Baagwani Evam Prabhandhan*".

Knowledge test scores gained by apple growers: The effectiveness of the e-booklet was measured in terms of gain in knowledge of the respondents accessed by 25 items. Primarily, a knowledge test was given to respondents before designing of e-booklet that was called pre-test. The pre-test was then followed by a post-test. Paired 't' test was calculated to test the significant difference in pre-test and post-knowledge level of

respondents. The knowledge test contain total twenty five statements. Pre and Post test scores were calculated. Table 3 depicts the data related to knowledge test scores of respondents and differences related to apple cultivation.

Table 3: Knowledge test scores of apple growers

S.no.	Statements	Pre-test score	Post-test score	Difference
1.	The flower color of the apple tree is White to Pinkish color	120	120	0
2.	Apple is known as the king of temperate fruit	70	114	44
3.	Which one is the ultra-dwarf rootstock of apple M-27	76	108	32
4.	Himachal Pradesh is called as apple bowl of India.	106	115	9
5.	The average rainfall for apple cultivation 100cm -125cm.	78	112	34
6.	The commercial method of propagation of rootstock Stooling	83	109	26
7.	Sanjose scale disease is controlled by Metasystox (25 EC)	98	120	22
8.	The most common method of training in apple modified central leader	95	120	25
9.	Apple variety having the highest storage life Ambri.	87	112	25
10.	Apple scab disease is controlled by Bavistin.	120	120	0
11.	Acid is present in apple fruit Malic acid.	71	103	32
12.	Planting space in an apple orchard is 6m*6m.	88	116	28
13.	The green color variety of apple Chaubattia Anupam	95	120	25
14.	General pit size for planting apple 1m*1m*1m.	68	105	37
15.	Which chemical is used to prevent apples from fruit borer Rogar (30 EC).	93	107	14
16.	Which chemical is used to prevent apples from powdery mildew Bavistin.	105	120	15
17.	Apple low chilling varieties require temperature and duration >800hrs below 7°C.	92	112	20
18.	Which is the leading state in producing apple Jammu and Kashmir	120	120	0
19.	The most critical period of water requirement in apple April-August.	120	120	0
20.	Which one is the ultra-dwarf rootstock of apple Red delicious.	89	115	26
21.	The ideal temperature for the growing season in apple is 20°-24°C.	97	120	23
22.	A most serious pest of apple Sanjose scale.	120	120	0
23.	Apple belongs to the family Rosaceae.	86	117	31
24.	The harvesting time of apple fruit in the hilly region in August and September.	120	120	0
25.	Wooly aphid is controlled by Thimet (10G).	93	120	27

Effectiveness of e-Booklet in terms of Gain in knowledge by apple growers: It is evident from the above table 4 that the value of 't' cal is higher than the value of 't' tab at a 1% level of significance. Thus, the null hypothesis that respondents have the same knowledge in pre and post-knowledge tests was rejected and the alternate

hypothesis was that the mean knowledge score was significantly higher in post-test than pre-test was accepted. Hence, it can be concluded that intervention of e-booklet creates changes in the level of knowledge of the respondents. Thus, it infers that intervention of e-booklet led to a significant gain in knowledge. Initially, apple growers had low knowledge regarding apple cultivation practices concept and practices as indicated by the low score in the pre-test ($X_1 = 9.125$). A significant increase in knowledge was observed after the intervention of e-booklet as their post-test score increased from 9.125 to 15.341. The gain in knowledge was 6.216. Thus, the e-booklet was found to be effective in terms of gain in knowledge of respondents. Hence, the intervention of e-booklet can be used as an effective medium to enhance the level of knowledge of apple growers. It can also be concluded that when e-booklet is a design based on the needs of the apple growers, a positive result can be obtained in not bridging the information and knowledge gap but in other possible aspects also. The findings of the present study are similar to Sharma (2013) that community radio module was effective in term of gain in knowledge.

Table 4: Effectiveness of e-booklet

Mean of pre-test score $\bar{X}_1$	Mean of post-test score $\bar{X}_2$	Mean of difference $\bar{d}$	Standard deviation of difference Sd	't' cal	't' tab
9.125	15.341	6.216	2.189	31.001	-2.378

***Indicate that value is significant at 1% level of significance*

Thus, the e-booklet demonstrated to be an effective tool for the development and generation of people participation. The study demonstrated the vast scope of the e-booklet as a potential tool of agricultural extension with its participatory approach. Study represent the significance of need assessment which should be followed before designing and executing any developmental media. The proposed study would also help the extension workers and policy makers to plan and design the need based media for the hilly region to disseminate the information regarding apple.

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