



ASSESSMENT OF INFORMATION TECHNOLOGY ENABLED SYSTEMS BY THE FARMERS

Boniface P.J¹, Sakeer Husain A² and Jose A.M³

^{1,3}College of Co-operation Banking and Management, Kerala Agricultural University

²Kerala Agricultural University, Thrissur, Kerala, India

ARTICLE INFO

Article History:

Received 6th January, 2022

Received in revised form 15th

February, 2022

Accepted 12th March, 2022

Published online 28th April, 2022

Key words:

Agricultural expert systems, agricultural portals, information needs, online trading, web browsing.

ABSTRACT

Information is the basic necessity of everyday life. This paper aims to study the information needs of the farmer to be made available through selected information technology enabled systems (ITES) namely web browsing, agricultural portals, agricultural expert systems, digitized databases and on line trading in agriculture and to study the level of satisfaction of farmers in meeting their information needs through these ITES. The study was conducted in the three districts of Kerala namely Thrissur, Malappuram and Idukki. A total of 300 computer literate farmers were the respondents of the study. The most information need of the farmer was found to be information on marketing scenario followed by plant protection and weather forecasts. Regarding the satisfaction level of farmers, the farmers were satisfied with information on crop production and moderately satisfied with rest of the information needs. Here it is recommended that efforts should be made to develop farmer centred ITES and update the same regularly so as to satisfy the information needs of the farmer.

Copyright©2022 **Boniface P.J et al.** This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

The purpose of the ITES is mainly to provide relevant, authentic and up-to-date information needed by the end users. Information technology (IT) had immense scope for its application in agriculture. IT plays an important tool in agricultural production and marketing (Thiruniraiselvi 2009). Mishra and Pant (2008) opined that huge amount of valuable information regarding agriculture can be obtained by the appropriate use of Information technology and one can boost the productivity, production and profitability by marketing their produce at better price. Several ITES are available nationwide for providing timely assistance to farmers.

Vijayan et al. (2016) reiterates that farmers should be equipped more with information so as to enable them to be a part of ICT revolution.

The Ministry of Agriculture, Government of India has set up 'Kissan Call Centres', a toll free service with the aim of providing answers to queries/problems of the farmers regarding crops, seeds, fertilizers, pesticides, horticulture, fisheries, forestry, veterinary animal sciences and allied areas. Still, only a very low percentage of farmers (14%) of Kerala were aware of the Kissan call centre (Koshy et al 2015).

Agricultural portals are a category of ITES which assist farmers in agricultural production, marketing and other farming activities. However, the farmers are rarely using the ITES for their information requirements. Hence, the training need of farmers was found very high on agricultural portals

(Boniface et al, 2019). The agricultural technology portal (www.celkai.in) covers agricultural technologies and package of practices of nearly 140 crops, information on animal husbandry and management, fish culture, agricultural machineries, and many other e-resources (Husain et al., 2016). Another novel information technology enabled system is Expert System which work based on artificial intelligence by the farmers to diagnose problems and seek solutions and reach decisions regarding crop cultivation practices/pest and disease management etc. on an interactive mode. Batra et al (2006) pointed out the importance of web based expert system which provides farmers, right information at the right time. Farmers resort to the ITES for agricultural technological information including package of practices of various crops, plant protection, marketing information, weather information and so on. Gupta et al. (2004) observed that information needs of farmers are not properly met. An efficient ITES should provide these information based on the need and requirements of the intended users. With this backdrop, the present study was undertaken with the objective of identifying the information needs of farmers to be made available through ITES and the satisfaction level with the present ITES in meeting the information needs.

METHODOLOGY

The study was conducted in three zones of Kerala viz., North, Central and South. From each zone, one district each were selected viz, Malappuram from north zone, Thrissur from central zone and Idukki from south zone. Malappuram is the

*Corresponding author: **Boniface P.J**

College of Co-operation Banking and Management, Kerala Agricultural University

first e-literate district in India. The headquarters of State Agricultural University is Thrissur which had developed various IT tools and services to farmers. Similarly, many farmers of Idukki district were engaged in online trading especially of pepper and cardamom. These factors were considered for the selection of these three districts. The sample selection was done by preparing a list of computer literate farmers who were accessing ITES for agricultural and related purposes from the website www.celkai.in, www.kissankerala.net and from the India Pepper and Spices Trade Association (IPSTA) for the year 2016. From the list so collected, 100 farmers were selected at random from each district, thus constituting a sample of 300 farmers. Five platforms of ITES viz., web browsing, agricultural portals, agricultural expert systems, digitized databases, and online trading were taken to find out the satisfaction level of farmers with the present ITES in meeting information needs.

For the purpose of the study, nineteen information needs were identified from reviewing relevant literature, and they were rated on a five point scale (Very much essential, Essential, Needed, Somewhat needed, Not needed with scores 4,3,2,1 and 0 respectively) Based on the scores obtained the indices were calculated by multiplying the score obtained by each item with 100 and then dividing with the total possible score for that item. The one with the highest index represents the most important need.. Later on those needs which secured an index of 40 or above were considered as the information need to be made available through ITES.

Level of satisfaction of individual farmer respondents were scored on a five point scale (ranging from highly satisfied to highly dissatisfied with a score range of 4 to 0) with respect to the currently available ITES in satisfying each of their identified information needs.

RESULTS AND DISCUSSION

The score obtained as well as the index of each information need is given in Table 1

Table 1 Information needs of farmers to be made available through ITES

Sl. No.	Information Needs	Value	Index	Rank
1	Marketing information	4325	75.87	1
2	Plant protection	3885	68.15	2
3	Weather forecasts	3876	68	3
4	Agricultural schemes/programs	3823	67.07	4
5	General agricultural information/statistics	3774	66.21	5
6	Input supply and services	3587	62.93	6
7	Crop production	3530	61.92	7
8	Information sources	3110	54.56	8
9	Exchange of farmers experiences	3057	53.63	9
10	Training services/schedules	3040	53.33	10
11	Organic farming	3012	52.84	11
12	Post-harvest techniques	2563	44.96	12
13	Specialized vocations in agriculture	2468	43.24	13
14	Indigenous technologies	2341	41.07	14

It was observed from Table 1 that the farmer respondents were in highest need for marketing information (index: 75.87) followed by plant protection (index: 68.15), weather forecasts (index: 68), agricultural schemes/programs (index: 67.07), and general agricultural information/statistics (index: 66.21).

Marketing of farm produces is the difficult task that the farmers have to perform, and it involves lot of risk. Up-to-date

market information and market intelligent services can reduce the risk in it, enabling farmers to fetch good price for their produces. That is the reason why farmers adjudged marketing information as the most important need to be made available through ITES. Excluding this, the major problems faced by famers in their farming scenario includes pests and diseases, and weather adversities. Naturally farmers regarded these two as their next important information needs. The timely information on agricultural schemes/programs implemented by different development agencies is essential for farmers to become beneficiaries of those programmes/schemes. Similarly, many of the farmers are now a days interested in new vistas in agriculture, and they require general agricultural information and statistics.

The other important information needs of farmers were information on input supply and services(index: 62.93) and crop production (index: 61.92). Though these are very important in farming perspective, farmers were not in highest need for these two items (ranked in 6th and 7th position), because farmers had comparatively better knowledge on these two.

Of the 14 items, information on specialized vocations in agriculture and indigenous technologies were found of the lowest need.

Thus, the highest information needs of farmers to be made available through different ITES are marketing information, information on plant protection, weather forecasts, agricultural schemes/programs, and general agricultural information/statistics.

Under each of the above information needs, sub components were identified and their indices were calculated as mentioned earlier and the results are furnished in Table 2.

Table 2 Information needs (sub components) of farmers to be made available through ITES

Sl. No.	Information need	Information need item	Total score	Index
1	Marketing Information	Available Markets	1059	88.25
		Price of commodities	1053	87.75
		Demand for commodities	927	77.25
		Export/Import data	660	55
2	Plant Protection	Export/Import Procedures	519	43.25
		Diagnosis	966	80.5
		Control measure	924	77
		General idea about pests and diseases of crops	861	71.75
3	Weather forecasts	Prophylactic measures	762	63.5
		Rainfall	1008	84
		Drought	810	67.5
		Temperature	774	64.5
4	Agricultural schemes/programmes	Humidity	759	63.25
		Flood	717	59.75
		Availability of schemes/programmes	996	83
		Procedure to become a beneficiary	969	80.75
5	General agricultural information statistics	Problems and prospects of agriculture	879	73.25
		Agricultural scenario	858	71.5
		General data on agriculture	801	66.75
		Seeds	960	80
6	Input supply and services	Fertilizer	957	79.75
		Bio-fertilizers	894	74.5
		Plant protection chemicals	870	72.5
		Crop varieties	915	76.25
7	Crop production	Cropping pattern	858	71.5
		Crop cultivation practices	843	70.25
		Farm equipment	822	68.5
8	Information sources in agriculture	Information source on scientific agricultural practices	987	82.25

		Information source on latest agricultural technologies	936	78
		Information source on agricultural trainings	912	76
		Information source on agricultural inputs	858	71.5
9	Exchange of farmers' experiences	New initiatives	915	76.25
		Success stories	909	75.75
		Failed cases	789	65.75
10	Training services/schedules	Training institutions	906	75.5
		Training schedules	879	73.25
11	Organic farming	Organic cultivation practices	870	72.5
		Problems and prospects	840	70
		Registration of organic farm	744	62
12	Post harvest techniques	Value addition	894	74.5
		Processing	822	68.5
		Product diversification	723	60.25
13	Specialized vocations in agriculture	Nursery Management	681	56.75
		Landscaping	621	51.75
		Cultivation of medicinal plants	588	49
		Food Processing	573	47.75
		Apiculture	567	47.25
		Floriculture	555	46.25
14	Indigenous technologies	Mushroom cultivation	546	45.5
		ITK on crop production	822	68.5
		ITK on uses of plants/plant parts	816	68
		ITK on processing and value addition	810	67.5
		ITK on crop protection	798	66.5

Under marketing information, the respondents were more concerned about information on available markets (index:88.25), followed by price of various agricultural commodities (index:87.75), and demand for various commodities (index:77.25). These topped the marketing information need, because they were essential for farmers to get remunerative price for their produces, by knowing various markets available for selling their produces, analysing the demand and price in different markets and to take an informed and strategic decision in marketing of their commodities. whereas, the farmers were less concerned about export and import of the commodities.

In case of plant protection, respondent farmers were more in need of diagnosis of the problem (index: 80.5) followed by control measures (index:77), general idea about pests and diseases of crops (index:71.75) and prophylactic measures (index:63.5). Though all the items were important, farmers required more information on diagnosis of pests, diseases, nutrient deficiencies, physiological disorders, and other problems, so that they could effectively manage it. Logically, the control measures for the above diagnosed problems became the next important information need item, under plant protection. General idea about pests and diseases of crops and prophylactic measures that could adopt to prevent various pests and disease problems in crops would help the farmers further to guard their crops leading to higher yield, and hence these items were also registered as important with indices more than 60.

With regard to weather forecasts, farmers were more concerned with information on rainfall (index:84). This is because timely rainfall is very important in sprouting, pollination, growth, physiological development, fruit maturation, and so on, while untimely rainfall can adversely affect all these aspects of a crop. Hence accurate information on the rainfall is a very important information for a farmer, and he can adjust the cropping and management practices accordingly. Farmers were also in need of information on drought (index:67.5), temperature (index:64.5) and humidity (index:63.25).

An analysis of the information need items on agricultural schemes/programmes shows that the respondents were more interested in availability of the schemes (index:83) and procedure to be a beneficiary (index:80.75). These two are very important from the perspective of farmers to become beneficiaries of various schemes and get technical and financial support.

In case of general agricultural information statistics, farmers were keen in knowing about problems and prospects of agriculture (index:73.25), followed by agricultural scenario (index:71.5), and general data on agriculture (index:66.75). These were considered important by farmers, for getting updated with new trends in agriculture, may be for entering into new ventures, especially these farmers being innovative.

Regarding input supply and services, information on seeds (index:80), and fertilizers (index:79.75) were found highly important followed by bio fertilizers (index:74.5) and plant protection chemicals (index:72.5). All these inputs are essential components in farming, and information on its availability, types, application time and methods, quantity requirement, and related details are very much needed for farmers.

Under crop production, farmers considered information on crop varieties as the most important item with an index of 76.25. Information on crop varieties is vital, and the proverb, as you sow so you reap, substantiates it. The other significant items under this category includes information on cropping pattern(index:71.5), crop cultivation practices (index:70.25), and farm equipment (index:68.5).

With respect to information sources in agriculture, farmers regarded information source on scientific agricultural practices as the most important one (index:82.25) followed by that on latest agricultural technologies (index:78), agricultural trainings (index:76) and on agricultural inputs (index:71.5) This points to the fact that respondents are observant towards scientific agricultural practices and latest agricultural technologies. While considering the exchange of farmers' experience, it is found that information on new initiatives of farmers was the important item with an index of 76.25, followed by that on the success stories of farmers (index:75.75), and on failed cases (index:65.75). Thus the farmers were more vigilant towards new initiatives and success stories of other farmers, that would help them to know the niche areas of agriculture, understand the pros and cons of each venture, and to get motivated out the new initiatives of fellow farmers. The failed cases would also provide them sufficient learning on the drawbacks and negatives of certain ventures, which are to be carefully addressed.

Under the category of Training services/schedules, the farmers were in need of information about various training institutions (index:75.5) and the schedules of trainings organised in these institutions(index:73.25). Information on training institutions, and training schedules is necessary for farmers to enquire about the number, nature, and schedules of trainings undertaken by the institutions, and to attend trainings appropriate to their needs.

Under organic farming, indices show that the farmers were in need of information on organic cultivation(index:72.5), followed by problems and prospects of organic farming(index:70), and registration of an organic farm(index:62). Organic farming has now emerged as in

important alternative to conventional agriculture, in the context of pesticide residues and safe food, and this might be the reason for their need on organic cultivation practices. Still the farmers, being the practitioners, wanted to know the problem and prospects of organic farming. Registration of an organic farm requires lot of procedures, which have to be strictly followed, and farmers, in general, are unaware of these procedures, and hence they need it.

In the case of post-harvest techniques, information on value addition was found of highest priority with an index 74.50, followed by information on processing(index:68.5) and product diversification (index:60.25) Many times, farmers face problems of very low price for their produces, especially in the peak season, and this can be overcome only by value addition of the products, as value added products fetch more price and may have higher shelf life. For the same reason, farmers considered information on processing also as an important need.

In the case of specialized vocations in agriculture, all the information need items secured an index below 60, showing that, though these information were needed by the farmers, they did not consider it as essential. Nevertheless, information on these vocations were needed by farmers for additional income generation. Among the different specialized vocations in agriculture, information on nursery management was found more important (index:56.75).

Table 2 reveals that, under the category of indigenous technologies, indigenous technical knowledge (ITK) on crop production secured an index of 68.5, followed by ITK on uses of plants and plant parts (index:68), ITK on processing and value addition (index:67.5) ITK on crop protection (index:66.5). The almost similar indices obtained for different items mentioned above shows that, under the category, indigenous technologies, all the items were almost equally relevant and important to the farmers.

Satisfaction of farmers with the present ITES in meeting information needs

Farmers require relevant, up-to-date, and latest technical information for performing various farming activities. The extent to which the selected ITES could satisfy the information needs of farmers reflects the effectiveness of the ITES, and hence an attempt in this direction was made in this study. The sample size for this analysis was restricted to 270 because those farmers who used at least one of the selected five ITES, viz., web browsing, agricultural portals, agricultural expert system, digitized database and online trading, were considered.

Table 3 Satisfaction index of farmers in meeting information needs through ITES

Sl. No.	Information Needs	Satisfaction Index
1	Crop production	64.8
2	General agricultural information/statistics	58.7
3	Information sources in agriculture	56.4
4	Input supply and services	56.1
5	Specialized vocations in agriculture	54.3
6	Plant protection	52.7
7	Weather forecasts	52.3
8	Post-harvest techniques	52.2
9	Marketing information	49.4
10	Organic farming	44.8
11	Agricultural schemes/programs	44.7
12	Training services/schedule	43.4
13	Indigenous technologies	42.7
14	Exchange of farmer experiences	42

Thus the selected fourteen information needs were scored for their level of satisfaction, and the satisfaction indices were calculated for each of them, and the results are given in Table 3.

The results depicted in Table 3.reveals that the information need, crop production registered the highest index 64.8, followed by general agricultural information/statistics (index 58.7), information sources in agriculture (index 56.4), input supply and services (index 56.1), specialized vocations in agriculture (index 54.3), plant protection(index 52.7), weather forecasts (index 52.3), and post-harvest techniques (index 52.2). The farmers showed medium level satisfaction with the selected ITES in providing these information, except for crop production, where the farmers were more satisfied. Still lower level of satisfaction of the farmers towards ITES was noticed in satisfying the information needs such as marketing information (index 49.4), organic farming (index 44.8), agricultural schemes/programmes (index 44.7), training services/schedule (index 43.4), indigenous technologies (index 42.7) and exchange of farmers’ experiences (index 42). It is worth to note that the level of satisfaction of farmers was very low with respect to their most important information need, marketing information.

Thus it can be inferred that the farmers had an average level of satisfaction with the ITES in meeting many of the information needs mentioned earlier, in which the crop production aspects topped the list. The present study has analysed the association between level of satisfaction of farmers and their information needs too.

The correlation coefficient value was found to be -0.19 and negatively significant at 5 per cent level (significance of 0.036).. When the information need of farmers increases, their expectation from ITES would be high. Consequently, the level of satisfaction of such farmers would become low, leading to significant negative relationship

CONCLUSION

The present platforms of ITES is serving the farming community with various sources of information and data. However, the present study attempted to improvise the present ITES by probing into the need for information and data to be included in the ITES platforms for the benefit of the stakeholders. The study identified that the farmers highly preferred to have information on marketing scenario followed by plant protection, weather forecasts, agricultural schemes/programmes, general agricultural information/statistics, input supply and services, crop production, information sources in agriculture, exchange of farmers experiences, training services/schedules, organic farming, post harvest techniques, specialized vocations in agriculture and indigenous technologies.

The study on the satisfaction of the farmers with the present ITES in meeting their information needs was examined with 14 variables and it was found that no farmer was moderately satisfied with the sufficiency of information provided through any of the ITES available, except for crop production information. Hence, efforts should have to be made to develop farmer centred ITES, and update the same regularly to satisfy the information needs of farmers.

References

- Batra, K.H., Chandrasekaran, M., Pillai, S., Sanjiv, K., Charu, S., Sonia, G., and Rini, G.2006. Ag-protect-an information technology based information dissemination system for Crop protection. In: Patil, V.C. and Seishi, N. (eds.) *Proceedings of the fifth Int.Conference of the Asian Federation for Information technology in agriculture*; 9 Nov, 2006; Bangalore, pp: 502-506.
- Boniface, P.J., Jose, A.M., and Husain A.S. 2019. Training needs of farmers and agricultural extensionists on selected information technology enabled systems for agriculture. *J. Ext.Educ*31(1): 6209-6215
- Gupta, S.P. Amardeep and Kushal, V. 2004. Information needs of livestock farmers, *Agrl. Extension Rev.*, 16(1): 15-17.
- Husain A.S., Ahamed P., and Nithin, K.M. 2016. Stakeholderparticipatory design and development of an agri info-tech portal. *J. Agric. Ext. Mgt.* 17(2): 25-33.
- Koshy, S., Husain, S., and Kumar, K. 2015. Agricultural information delivery mechanism using ICT: A case study from Kerala, India. In: *Proceedings of IEEE International Symposium on Technology in Society (ISTAS)*, 11-12 November 2015, Dublin, Ireland. Society on Social Implications of technology, Ireland.
- Mishra, M.K and Pant, S. 2008. Information technology: The best tool for Agriculture Research and Extension, *Agrobios Newsletter*, Jan 2008. VI (8): 54-55
- Thiruniraiselvi, D. 2009. IT Sector and Indian Agriculture, *Kisan World*, 36(6): 29-32
- Vijayan B, Gangdharappa N.R., Supriya D. 2016. *Impact of kissan Kerala on information empowerment of farmers of Kerala, Ijournal, J. global Communication*, 9: 224-230.

How to cite this article:

Boniface P.J et al (2022) 'Assessment of Information Technology Enabled Systems by the Farmers', *International Journal of Current Advanced Research*, 11(04), pp. 752-756. DOI: <http://dx.doi.org/10.24327/ijcar.2022.756.0172>
