

Farmers' perception on usefulness of ICT initiatives in Agriculture

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Abstract

A study was conducted to determine the perception of farmers on the usefulness of ICT initiatives for farming. Farmer beneficiaries of ICT initiatives namely, aAQUA, e-choupal, V-Agri, V-Aqua, e-Sagu and Farmers Call Centre (FCC) covering Maharashtra, Madhya Pradesh and Andhra Pradesh were interviewed. The results of the study revealed that the initiatives were moderately useful for farmers for obtaining agriculture and related information for their farms. Though, the queries of farmers were addressed as required, the expectations of the farmers are high and hence the utility and performance of the ICT initiatives need to be improved.

Introduction

According to the Economic Census (2005), 85 per cent of the households are operating on 2 ha of farm land or less. The National Assessment Survey of farmers, NSSO (2005), observed that the average monthly per capita expenditure (MCPE) of a farm household is just 503 with 27 per cent of farmers not interested in farming, while 40 per cent felt that, if given an option they would prefer another career or profession. It also mentions that only 40 per cent of farmers accessed information on modern technology through various sources including ICT. However the spread of information is slow. This malady of slow diffusion indicates the potential application of ICT in agriculture as a tool and technique.

The farmer has been facing rising input costs, declining returns from inputs, uncertain market, increasing role of marketing in agriculture and blurring of distinction between the domestic and the international market. To assist the farmer in this changing scenario, new strategies and innovative solutions are urgently required which in turn will require technological support. Hence the agricultural research system which generates technologies has to conduct the business of agricultural research in an innovative way. The World Bank aided National

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Agricultural Innovation Project (NAIP) has been conceived to pilot such innovations in conducting agricultural research. The overall objective of NAIP is to facilitate accelerated and sustainable transformation of Indian agriculture in support of poverty alleviation and income generation by collaborative development and application of agricultural innovations by the public research organizations in partnership with the private sector, the civil society organizations and other stakeholders. An ICAR funded NAIP Sub-project entitled "Development of a Set of Alternative ICT Models based on a study and analysis of the major ICT initiatives in Agriculture in India to meet the information need of the Indian farmers" is under implementation on consortium mode led by Media Lab Asia (MLA), New Delhi with Acharya N.G.Ranga Agriculture University (ANGRAU), National Institute for Rural Development (NIRD), Hyderabad, and Mudra Institute of Communication, Ahmedabad (MICA) as partners. The project aims to study the major ICT initiatives in agriculture in India, the extent of their success, and the factors affecting the success. Based on this study, the project will suggest appropriate ICT models to meet farmers' information needs for different selected scenarios considering the infrastructural and socio-economic constraints, after field testing.

Recognizing the importance of Information and Communication Technology and to empower the agricultural community with needed information and knowledge, a number of ICT initiatives have been implemented in different states by various institutions including the government, NGOs and private companies. As a part of the NAIP Sub-project, the perception of farmers on the usefulness of ICT initiatives in agriculture was studied.

Methodology

Six ICT initiatives namely V-Agri, V-Aqua, e-sagu, Farmers Call Centre (FCC), aAQUA and e-choupal which are in operation in Andhra Pradesh, Maharashtra and Madhya Pradesh were selected by ANGRAU under the NAIP project entitled "Development of a Set of Alternative ICT Models based on a Study and Analysis of the major ICT Initiatives in Agriculture in India to meet the Information need of the Indian Farmers" for the study.

Keeping in view the objectives of the study, a structured schedule was developed, pre-tested and used for interviewing the respondents. For each initiative, 30 beneficiaries were selected randomly. The respondents were interviewed

personally for all the selected initiatives except aAQUA and FCC where the respondents were telephonically interviewed, using a pre-tested structured interview schedule. To measure the perception of usefulness of ICT initiatives, 13 statements were framed. Each statement was measured against a 3 point continuum: Agree, Undecided and Disagree with a score of 3, 2 and 1 respectively and the score was reversed with negative statements. The perception on usefulness was categorized into less, moderately and highly useful with the help of mean and standard deviation (SD).

Results and Discussions

The data collected from respondents were coded, tabulated and are presented in Tables 1 and 2.

1. aAQUA, Maharashtra

aAQUA which stands for *almost All Questions Answered* is a farmer-expert Q&A database supporting Indian languages. It is an online multilingual, multimedia agricultural portal for disseminating information to the Indian agricultural community at the grassroots. The technology for Almost All Questions Answered (aAQUA) was developed by Developmental Informatics Lab, KReSIT, IIT, Bombay and was sponsored by Media Lab Asia and Development Gateway Foundation's R&D Center.

The System answers farmers queries based on the location, season, crop and other information provided by farmers. An aAQUA question is posted either by a registered user directly or through a telecenter/kiosk operator who has an account in aAQUA. Usually the question is from a farmer whose profile information provides details such as crop, farm size, pesticides and fertilizers use, dosage etc. The prices of various commodities along with their varieties are displayed spatially over a map. The user can decide where to sell his produce to get the maximum profit, depending on the prices and the distance of the markets.

As seen from Table 1, that majority of the beneficiaries of aAQUA revealed that the initiative provided clear (90.0%), timely (76.66%) and complete information (63.33 %). Further, 83.33 per cent of the respondents felt that the information provided is practicable/ adaptable in the field conditions.

Table 1: Perception of Beneficiaries on the Usefulness of ICT initiatives

Sl. No	Statements	aAQUA						e-choupal						V-Agri					
		Agree		Undecided		Disagree		Agree		Undecided		Disagree		Agree		Undecided		Disagree	
		F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
1	ICT initiative tries to give clear information.	27	90	1	3.33	2	6.67	30	100	0	0	0	0	30	100	0	0	0	0
2	ICT initiative provides the farmers timely information.	23	76.66	4	13.33	3	10.00	29	96.67	1	3.33	0	0	30	100	0	0	0	0
3	Information provided by ICT initiative is incomplete.	5	16.66	6	20.00	19	63.33	3	10.00	5	16.67	22	73.33	0	0	5	16.67	25	83.33
4	The information provided by ICT initiative is not easily understandable.	11	36.66	2	6.67	17	56.67	0	0	8	26.67	22	73.33	0	0	2	6.67	28	93.33
5	ICT initiative provides information throughout the production cycle.	23	76.66	6	20.00	1	3.33	22	73.33	5	16.67	3	10.00	25	83.33	3	10.00	2	6.67
6	Many times ICT initiative ensures free exchange of information.	23	76.66	7	23.33	0	0	15	50.00	14	46.67	1	3.33	1	3.33	4	13.33	25	83.33
7	I do not accept that information provided by the ICT initiative is valuable.	21	70.00	5	16.66	4	13.33	3	10.00	18	60.00	9	30.00	0	0	5	16.67	25	83.33
8	Many a times ICT initiatives are inattentive to the farmers.	3	10.00	14	46.67	13	43.33	2	6.67	20	66.67	8	26.67	28	93.33	2	6.67	0	0
9	I feel ICT initiative is not using a variety of tools to provide information.	5	16.66	19	63.33	6	20.00	3	10.00	19	63.33	8	26.67	0	0	3	10.00	27	90.00
10	ICT initiatives allowed farmers to give feedback	0	0	15	50.00	15	50.00	11	36.67	19	63.33	0	0	26	86.67	0	0	4	13.33
11	ICT initiative used unsuitable ICT tools.	2	6.67	19	63.33	9	30.00	2	6.67	22	73.33	6	20.00	1	3.33	2	6.67	27	90.00
12	ICT initiative is providing information related to only one crop/livestock/enterprise.	12	40.00	9	30.00	9	30.00	10	33.33	14	46.67	6	20.00	0	0	3	10.00	27	90.00
13	The information provided is practicable / adaptable in the field conditions.	25	83.33	4	13.33	1	3.33	12	40.00	15	50.00	3	10.00	30	100	0	0	0	0

Contd.....

Sl. No	Statements	V-Aqua						e-Sagu						FCC					
		Agree		Undecided		Disagree		Agree		Undecided		Disagree		Agree		Undecided		Disagree	
		F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
1	ICT initiative tries to give clear information.	30	100	0	0	0	0	27	90.00	3	10.00	0	0	27	90.00	2	6.67	1	3.33
2	ICT initiative provides the farmers timely information.	30	100	0	0	0	0	9	30.00	21	70.00	0	0	20	66.67	7	23.33	3	10.00
3	Information provided by ICT initiative is incomplete.	0	0	7	23.33	23	76.67	8	26.67	20	66.67	2	6.67	15	50.00	5	16.67	10	33.33
4	The information provided by ICT initiative is not easily understandable.	0	0	3	10.00	27	90.00	8	26.67	16	53.33	6	20.00	6	20.00	14	46.67	10	33.33
5	ICT initiative provides information throughout the production cycle.	27	90.00	1	3.33	3	10.00	10	33.33	7	23.33	13	43.33	12	40.00	14	46.67	4	13.33
6	Many times ICT initiative ensures free exchange of information.	0	0	3	10.00	27	90.00	6	20.00	8	26.67	16	53.33	17	56.67	8	26.67	5	16.67
7	I do not accept that information provided by the ICT initiative is valuable.	0	0	6	20.00	24	80.00	5	16.67	14	46.67	11	36.67	5	16.67	12	40.00	13	43.33
8	Many a times ICT initiatives are inattentive to the farmers.	0	0	2	6.67	28	93.33	7	23.33	9	30.00	14	46.67	11	36.67	13	43.33	6	20.00
9	I feel ICT initiative is not using a variety of tools to provide information.	1	3.33	2	6.67	27	90.00	9	30.00	10	33.33	11	36.67	11	36.67	13	43.33	6	20.00
10	ICT initiatives allowed farmers to give feedback	29	96.67	1	3.33	0	0	10	33.33	14	46.67	6	20.00	5	16.67	13	43.33	12	40.00
11	ICT initiative used unsuitable ICT tools.	0	0	0	0	30	100	11	36.67	17	56.67	2	6.67	12	40.0	10	33.33	8	26.67
12	ICT initiative is providing information related to only one crop/livestock/enterprise.	0	0	1	3.33	29	96.67	14	46.67	11	36.67	5	16.67	17	56.67	5	16.67	8	26.67
13	The information provided is practicable / adaptable in the field conditions.	30	100	0	0	0	0	14	46.67	11	36.67	5	16.67	17	56.67	9	30.00	4	13.33

Table 2 depicts that perception on usefulness about aAQUA is considered to be medium by the majority of the beneficiaries (56.67 %) followed by highly useful (23.33 %) and less useful (20 %). The outcome of aAQUA can be judged by the farmers, in view of the benefits they were getting from the initiative. More than half of them were getting information as they required. Hence the perception level is medium.

2. e-choupal, Madhya Pradesh

Choupal is a Hindi word which means “village meeting place”. A market is a meeting place where vendors and customers come together to do transactions. e-choupal, an Indian Tobacco Company (ITC) initiative is a virtual market place where farmers can transact directly with a processor and can realize better price for their produce. E-choupal has the advantages of the market but spans large varieties of vendors and customers. Geographical distances do not restrict participation in the e-choupal. Launched in June 2000, ‘e-Choupal’, has already become the largest initiative among Internet-based interventions in rural India. ‘e-Choupal’ services today reach out to over 4 million farmers growing a range of crops - soyabean, coffee, wheat, rice, pulses, and shrimp - in over 40,000 villages through 6500 kiosks across ten states (Madhya Pradesh, Haryana, Uttarakhand, Karnataka, Andhra Pradesh, Uttar Pradesh, Rajasthan, Maharashtra, Kerala and Tamil Nadu).

- Village internet kiosks managed by farmers (called sanchalaks) themselves, enable the agricultural community access information in their local language. The previous day’s mandi closing price is used to determine the benchmark Fair Average Quality (FAQ) price at the e-choupal, which is static for a given day. The information of mandi price is communicated through the e-choupal portal. If and when the connection fails, the sanchalak calls an ITC field representative. To initiate a sale, the farmer brings a sample of his produce to the e-choupal. The sanchalak performs the quality test in the farmer’s presence and must justify any deduction to the farmer. This ensures transparency in a process where quality testing and pricing happens at multiple levels. If the farmer chooses to sell his produce to ITC, the sanchalak gives him a note capturing his name, his village, quality test report, approximate quantity and conditional price. The farmer takes the note from the sanchalak and proceeds with his crop to the nearest ITC procurement hub. Some procurement hubs are ITC’s factories that also act as collection points.

As evident from Table 1, cent per cent of the beneficiaries revealed that e-choupal tries to give clear information and 96.67 per cent of them said that they get timely information from the initiative. It was also noticed that an equal number (73.33 %) of the beneficiaries opined said that the information provided is complete and is easily understandable as shown in table 1.

Table 2 revealed that 66.67 per cent of the beneficiaries have medium level of perception followed by low (20%) and high perception (13.33%) about the usefulness. The outcome of the e-choupal can be judged by the farmers, in view of the benefits they were getting from the initiative. More than half of them were getting information as they required. Hence the perception level is medium.

Table 2. Perception on Usefulness of Services

Sl. No.	Category	aAQUA		e-choupal		V-Agri		V-Aqua		e-sagu		FCC	
		F	%	F	%	F	%	F	%	F	%	F	%
1	Less useful	6	20	6	20	5	16.67	1	3.33	6	20	4	13.33
2	Moderately useful	17	56.67	20	66.67	23	76.67	27	90	19	63.33	22	73.33
3	Highly useful	7	23.33	4	13.33	2	6.67	2	6.67	5	16.67	4	13.33
Total		30	100	30	100	30	100	30	100	30	100	30	100
Mean		30.0		32.2		34.0		35.26		27.2		27.7	
SD		3.72		4.01		1.57		4.99		2.96		3.45	

3. V-Agri initiative, Andhra Pradesh

Byrraju Foundation, Bhimavaram, West Godavari district has initiated V-Agri programme to provide INPM services to farmers by utilizing the IT infrastructure at its disposal. V-Agri programme mainly covers primary problems like inadequate extension support to farmers, declining soil fertility due to inappropriate/imbalanced nutrient use, increasing severity of pest and disease pressure, poor water management practices, post harvest losses, declining profits due to increasing production costs, inadequate credit support, crop insurance and unfavourable market linkages.

In V-Agri programme the local field coordinator visits the farmer's fields, takes the photos, and these photos are sent via Ashwini centres to Byrraju foundation,

Suggestions are given by the experts and the results are sent back to farmers in the form of hard copies. Every fortnight, farmers problems are addressed through a conference with experts and solutions are given.

Results in Table 1 show that cent per cent of the beneficiaries' perceived that V-Agri provides clear as well as timely information and 93.33 per cent of them said that the information is easily understandable. Further, an equal number (90%) of farmers feel that the initiative is using a variety of tools to provide information which is restricted to a few crops.

Most of the beneficiaries (76.67%) said that the V-Agri initiative was moderately useful, 16.67 per cent expressed that it was less useful and 6.67 per cent revealed that it was highly useful (Table. 2). Majority of the respondents were using the initiative as per their convenience.

4. V-Aqua, Andhra Pradesh

V-Aqua, a Byrraju Foundation initiative provides IT based advisory service to registered farmers; the programme pays special attention to aquaculture (and associated activities) that have the potential to alleviate poverty indirectly. It recognizes and supports the role of women in aquaculture, linked activities and is also transparent and accountable in its work.

The local field coordinator visits the farmers ponds, observes the condition of fish growth, dissects the fish under microscope to know the health conditions (mainly disease identification if any), takes the photos of dissected fishes, and sends these photos via Ashwini centres to Byrraju foundation. Suggestions are received from the experts and the results are sent back to farmers.

Cent per cent of the beneficiaries responded that V-Aqua provides clear and timely information (Table 1), 93.33 per cent of them revealed that the initiative is very attentive to the farmers in providing the information and 90 per cent of them said that information provided is easily understandable but the initiative doesn't ensure free exchange of information.

Perception on usefulness of V-Aqua initiative services of beneficiaries can be seen in Table.2. Majority of the respondents (90%) had medium level of perception followed by high level of perception (6.67%) and low level (3.33%) about the usefulness of V-Aqua initiative.

5. e-Sagu, Andhra Pradesh

In e-Sagu, a project sponsored and managed by Media Lab Asia, rather than visiting the crop in person, the agricultural scientist delivers the expert advice by obtaining the status of the crop in the form of digital photographs and other information. e-Sagu contains five parts: (i) Farms (ii) Coordinators (iii) Agricultural experts (iv) Agricultural Information System (AIS) and (v) Communication system.

The main Centre of eSagu is housed at the International Institute of Information Technology (IIIT) in Hyderabad. It consists of a team of about 20 agricultural experts and an Agricultural Information System comprising of crop photos, farm database, weather data, etc. Media Lab Asia has been set up by DoIT, Gol as a not-for-profit research organization under section 25 of the Companies Act. The project design is by Media Lab Asia and IIIT Hyderabad. The eSagu local Centre is located at cluster level and is run by the project. The local centres are linked with the main centre through internet, telephone and courier services. The farmers are linked to the local centre through specially trained farmers called coordinators.

e-Sagu operates in the following manner. Several farms are assigned to each coordinator. The farmer of the corresponding farm registers into the system by supplying the relevant information including soil data, water resources, and capital availability through the coordinator. Coordinators visit the farm on a daily or weekly basis and send the crop details in the form of text and digital photographs through the communication system. Agricultural Experts prepare the advice by accessing the soil data, farmer's details, crop database, based on the information sent by the coordinators. The advice contains the steps the farmer should take to improve crop productivity. The Agricultural Experts prepare the advice in English (which is translated to the local language) and store it in the system. The coordinator accesses the advice through Internet, explains the same to the farmer, gets the feedback and sends it to the Agriculture Expert.

It is clear from Table 1 that 90 per cent of the beneficiaries agreed with the statement that the initiative provides clear information to the farmers as required.

Most of the beneficiaries (63.33 %) said that the e-Sagu initiative was moderately useful, 20 per cent of them indicated that it was less useful and 16.67 per cent revealed that it was highly useful (Table.2)

6. Farmers Call Centre, Andhra Pradesh

Farmers Call Centre was inaugurated in Andhra Pradesh on July 1st, 2003 with an innovative idea of transferring novel scientific technology in Agriculture

to the farming community. The Government of Andhra Pradesh launched Parishkaram Call Centre with agriculture services as its pilot project with experienced scientists of Acharya N.G. Ranga Agricultural University. This call center is accessible to the farmers of Andhra Pradesh on toll free numbers 1100 or 1800 425 1110 connected to all villages. It works on all Government working days from 10.00 A.M. to 5.00 P.M.

Farmers in the state of Andhra Pradesh can make use of this facility to seek clarification on problems faced by them in raising various crops and get suggestions by interacting directly with the experienced scientists. Since inception of the call centre 1,36,440 farmers from different districts of Andhra Pradesh have utilized the service of the Farmers Call Centre and have benefited by taking the advice from the Scientists of Acharya N.G. Ranga Agricultural University on various crops. The Call centre has successfully completed seven years with thousands of regular callers seeking to resolve their problems in agriculture. Apart from these, scientists are also disseminating information through mass media (Television, Radio, Daily Newspaper and Monthly magazines) so as to disseminate the information to the maximum number of farmers.

There are two levels of operation of the Farmers call centre. The farmer's call is first received at level-I, where the operator records the farmer's personal details and then based on the query, transfers the call to the concerned scientist at level-II Various experts from crop production, crop protection, horticulture and department of agriculture are present at level 2 to clarify the farmer's doubts.

It is clear from Table 1 that 90 per cent of the beneficiaries agree with the statement that the initiative provides clear information to the farmers as required and more than half of the farmers (66.67 %) said that timely information is provided.

Table 2 shows that most of the beneficiaries (73.33%) perceived that the FCC initiative was moderately useful. An equal number of beneficiaries (13.33 %) perceived that it was less useful and highly useful.

Conclusion

As observed in the six initiatives studied, a majority of the respondents have perceived that the ICT initiatives were moderately useful to them. This could be attributed to the two-step flow of communication in the form of field coordinators in four of the six initiatives studied except in case of aAQUA and FCC which are internet and telephone based initiatives respectively.

One of the success factors for the initiatives observed was to strengthen the participation of farmers through traditional methods like participatory approaches. For example, as observed in case of e-choupal, a local farmer in the village can serve better for the initiative to function effectively for the farmers benefit. Financial assistance and sustainability play a major role in the successful functioning of the initiatives for farmers at grass root level. The technical knowledge and competencies of the field coordinators employed at grass root level for the ICT initiatives, need to be updated with a view to provide useful information to the beneficiaries. The initiatives require continuous financial assistance and technical support from the experts so that farmers can get information in time and at minimum cost.

References

- Economic census, (2005). www.mospi.gov.in/economic_census
- National Assessment Survey of farmers, NSSO, (2005). www.mospi.gov.in/nssso_4aug 2008.
- Ranjit and Hansra, (1992), Information needs of farmers, Indian journal of Extension Education, Vol. XXVIII, Nos 1&2.
- Meera, Shaik N., Jhamtani, Anita and Rao, D.U.M. (2004), Information and communication technology in agricultural development: a comparative analysis of three projects from India, Agricultural Research & Extension network, network paper no. 135.
- Meitei, Shanta and Purnima Devi, (2009), Farmers information needs in rural Manipur: an assessment, Annals of library and information studies, Vol. 56, pp 35-40.

