Interactive information dissemination system (IIDS) – An Alternative I.C.T model to meet the information needs of Indian farmers

Dr. P Punna Rao, Dr. K Raja Reddy, Dr. T.S. Anurag, M Mahadevaiah and P Sailu

Abstract
Interactive Information Dissemination System (IIDS) has been designed after rigorous field study of 26 ICT initiatives in agriculture in India and information needs assessment of farmers across 12 states of India. This study was undertaken in a project awarded by Indian Council of Agricultural Research (ICAR) under National Agricultural Innovation Project (NAIP). The IIDS is now being up scaled in two states. The benefits realized by the farmers are personalized advices on Agriculture, Horticulture, Animal Husbandry and Fisheries. Farmer can record their queries 24x7 through Toll Free Number. Farmers are provided with Text & Voice messages in local language (Telugu). Farmers are provided emergency messages and alerts on their mobile. The impact of IIDS is seen on shift in the Source of Information and was found that the farmers who were earlier dependent for agriculture information on their friends & neighbours and Input dealers are now calling on Scientists on toll free number. The IIDS has got vast scope to cover in all State Agricultural Universities in India to enhance outreach.

Keywords: IIDS, information needs, ICT, State Agricultural Universities.

1. Introduction
The Indian Council of Agricultural Research (ICAR), Government of India, New Delhi has awarded the project under National Agricultural Innovation Project (NAIP) to Media Lab Asia, as a Consortium Leader with Acharya N.G. Ranga Agricultural University (ANGRAU), Guntur, National Institute of Rural Development (NIRD), Hyderabad and Mudra Institute of Communication, Ahmedabad (MICA) as the partners, to develop an alternative ICT model to meet the information needs of Indian farmers. As part of that, Interactive Information Dissemination System (IIDS) was developed and successfully pilot tested in Andhra Pradesh and Telangana states of India.

The IIDS has been launched by the Secretary Government of India, Department of Electronics and Information Technology, Ministry of Communications and Information Technology (MCIT) in Acharya N G Ranga Agricultural University in 2013. After successful implementation of the IIDS model in Andhra Pradesh and Telangana states, the same model was implemented in Central Agricultural University, Imphal as m4agriNEI.

2. Literature Review
Gidda Reddy et al., (2011) [2-4] reported that, quality inputs availability, pest and disease management, updated weather and market information, farm mechanization, and government schemes were the major information needs of farmers. Gidda Reddy et al., (2011) [2-4] stated that, the ICT initiatives are 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.

Gidda Reddy et al., (2011) [2-4] reported that, becoming member of the ICT initiatives, majority of the beneficiaries are being respected by the villagers and consulted them for the agricultural information.

Anurag et al., (2014) [1] concluded that, the concept of IIDS is very relevant to the agricultural extension functionaries. The information dissemination through multimedia (Text, Voice, Image and Video) is very appreciable; if one mode of dissemination is failed other can reach the farmers. IIDS will be a better alternative ICT model to the farmers because; from field itself he/she can interact directly with the scientists.
3. Methodology
A comprehensive need assessment study was carried out to develop an understanding of the agriculture related ICT needs and problems of the farmers in using ICT, with a special focus on the small and marginal farmers in using ICT in various agro and socio-economic situations by doing primary survey using structured schedules / questionnaires, focused group discussion and Participatory Rural Appraisal. Total of 26 ICT initiatives in agriculture were studied covering 1381 Farmers in 57 selected sample villages in 12 states of India to elicit the felt need of the farmers, prioritize their perceptions and bring out the reality of the issues involved in development of ideal ICT applications for agriculture.

An impact analysis cum feedback study has been conducted with 360 farmers in 3 villages of Nalgonda district named Somaram, Mupparam and Balemla and 3 villages of Nellore named Pedaputhedu, Vavveru and Mypadu (Each village 60 respondents) by using project evaluation questionnaire.

4. Results and Discussion

4.1 Situation analysis
Mobile is the most popular ICT gadget among the farming community; the study shows that 72 per cent of the farmers possess mobile phones, followed by TV (61%) and Radio (42%). Radio is most popular in the area where the power availability is very poor. Farmer needs information mainly on Pest and Disease (45%), Field Preparation (44.9%), Nutrient Management (41%), Input Availability (39.5%), Market Information (32%) and Weather Information (22%). Most of the farmers believed in the information provided by their Friends and Neighbors (61.5%) followed by ICT provider (53%) and Local Input Dealer (46.4%).

4.2 Way Forward
The major findings of this study are crucial for choosing and designing the future strategy and system to provide ‘Information to the farmers as and when they require’. There is a requirement for an integrated approach which should cater the problems of farmers in using ICT applications in agriculture such as accessibility, acceptability, simplicity, timely & useful information (right from the choice of inputs in the farming system to marketing of the farm products) in location specific manner. In view of the above, the following approach is envisaged in an ICT based holistic extension system:

- There is a need for aggregation & cater the farmer queries in multimedia mode i.e voice mode (i.e. in local language) along text, image and video.
- Requirement of farmer friendly and simple interfaces to access information and advisory services in effective manner preferably through smart phones
- Need is to develop a combination of push and pull based interactive system (essentially pull based) so that the communication can be possible in both ways, i.e from farmers to expert and vice versa.
- Requirement for interlinking of location specific information from various service providers to cater the specific needs of the farmers
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- Requirement of maintaining farmer’s database with their farming details, so by referring to it an expert can provide appropriate solution to concerned farmer’s query.
- Requirement of expert support system which has user friendly interfaces and reference content (e.g SAU’s Knowledge repository, farmer’s details, FAQs from the farmers’ query, etc) for fast and proactive delivery of advices. The system should also facilitate an expert to be virtually available by giving him any time anywhere access.

4.3 Interactive Information Dissemination System (IIDS)
This is an integrated model based on the study and analysis of 26 major ICT Initiatives in agriculture in India. This model is largely integration of Toll free IVRS, Smart Phone Application and Web based agricultural advisory system. The major limitation in current information dissemination system i.e call center, IVRS system and mobile services are lack of
Farmer's feedback

- Farmers are able to talk to the Scientists directly over a mobile phone.
- Farmers are receiving the messages in local language, even with the basic phones.
- Farmers are receiving text as well as voice messages on their mobiles.
- Farmers are using the text messages as Reference and showing to the input dealers to get the right pesticide from the shop.
- Timely information helped in reducing no. of sprays/application of excessive use of fertilizers etc.
- Illiterate farmers are also comfortable in receiving messages, since information is given through voice messages.
- Messages related to production, protection, post-harvest and weather are sent to the mobiles of farmers.
- The Text and voice message facility in IIDS helped the farmers of Srikakulam, during Phailin and Hudhud cyclones.
- The weather forecasts helped the farmers, to avoid the unnecessary irrigations before rains, postponing of crop harvests etc.
- Short films are loaded in the mobiles of project farmers thereby farmers are accessible to the information with multimedia experience.
- Reduced production cost
- Increased awareness about use of ICTs in agriculture

4.3 Impact analysis

While interviewing the respondents regarding the perception of IIDS, 98.0 per cent of the respondents agreed that IIDS service is giving clear information on the subjects they required. 91.7 per cent of the respondents agreed that IIDS service is providing the farmers with timely information and 98.3 per cent of the respondents agreed that information provided by IIDS service is easily understandable.
• The effect of Scientist-Farmer interaction programme was appreciated by 66.2 per cent of the respondents.
• Majority of the respondents informed that usage of chemical fertilizer (88.8 % respondents) and pesticides (91 % respondents) has been reduced due to the fertilizer and pesticide management information provided by the IIDS model.
• The shift in the ‘Source of Information was found among the IIDS farmers and it was noted that 92 per cent farmers who were earlier dependent for agricultural information on their friends & neighbor is reduced to 56 per cent and 68.7 per cent farmers who were dependent on Input dealers is reduced to 35 per cent due to the provision given to the farmers to direct interact to the Krishi Vigyan Kendra (KVK) scientist on Toll Free number.

Table 1: Perception about the IIDS Model

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Statements</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IIDS service is giving the clear information.</td>
<td>98.00</td>
<td>0.6</td>
<td>1.4</td>
</tr>
<tr>
<td>2</td>
<td>IIDS service providing the farmers timely information.</td>
<td>91.7</td>
<td>0.00</td>
<td>8.3</td>
</tr>
<tr>
<td>3</td>
<td>Information provided by IIDS service is complete.</td>
<td>90.5</td>
<td>1</td>
<td>7.3</td>
</tr>
<tr>
<td>4</td>
<td>The information provided by IIDS service is easily understandable.</td>
<td>98.3</td>
<td>0.4</td>
<td>1.3</td>
</tr>
<tr>
<td>5</td>
<td>The information provided is practicable / adaptable in the field conditions.</td>
<td>97.9</td>
<td>0.4</td>
<td>1.3</td>
</tr>
<tr>
<td>6</td>
<td>Scientist – Farmer interaction Programmes are useful</td>
<td>66.2</td>
<td>30.2</td>
<td>3.6</td>
</tr>
<tr>
<td>7</td>
<td>Innovative Farmer to other farmers interaction programme is useful</td>
<td>69.3</td>
<td>31.2</td>
<td>9.5</td>
</tr>
</tbody>
</table>

Table 2: Progress in Agriculture due to the IIDS services:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Item</th>
<th>Increased</th>
<th>Decreased</th>
<th>No Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Use of chemical Fertilizers</td>
<td>1.7</td>
<td>88.8</td>
<td>9.5</td>
</tr>
<tr>
<td>2</td>
<td>Use of chemical Pesticides</td>
<td>2.2</td>
<td>91.2</td>
<td>6.6</td>
</tr>
<tr>
<td>3</td>
<td>Marketing information</td>
<td>90.4</td>
<td>7.1</td>
<td>2.5</td>
</tr>
<tr>
<td>4</td>
<td>Cost of cultivation for crops</td>
<td>4.5</td>
<td>87.0</td>
<td>8.5</td>
</tr>
</tbody>
</table>

Table 3: Source of Farm Information before & after the initiation of the IIDS service

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Sources</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IIDS service</td>
<td>97.5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Friends and neighbors</td>
<td>92.5</td>
<td>56</td>
</tr>
<tr>
<td>3</td>
<td>Local input dealers</td>
<td>68.7</td>
<td>35.0</td>
</tr>
<tr>
<td>4</td>
<td>Daily News Papers</td>
<td>32.0</td>
<td>17.0</td>
</tr>
<tr>
<td>5</td>
<td>Monthly Farm Magazines</td>
<td>21.0</td>
<td>18.0</td>
</tr>
<tr>
<td>6</td>
<td>Television</td>
<td>21.7</td>
<td>15.0</td>
</tr>
</tbody>
</table>

Case Studies
A) S. Bali Reddy, Duguwapalli Village, Tadipatri Mandal, Anantapur district
ID: 16214854, Mobile number: 9848398352, No. of calls made: 226
He has registered in IIDS through Krishi Vigyan Kendra (KVK) Reddipalli. He got the advisories on pest & disease management, fertilizer management, seed treatment chemicals, weather information etc. He has used the text messages as reference to buy the pesticide from dealers shop. I have reduced the no. of pesticide sprayings (from 3 to 2); applied recommended dose of fertilizers thereby reduced the cost of cultivation up to Rs. 3750/ha (due to reduced overdose of fertilizers and no. of sprayings) in Chickpea crop, and also got the market rate information from time to time though this IIDS, because of that, he sold his produce for better price and finally got the extra income of Rs. 13,750/- per ha in Chickpea crop.

B) T. Venkata Ramana, Chettupodilam Village, G. Sigamand Mandal, Srikakulam district
ID: 10113731, Mobile number: 8096394921, no. of calls made: 256
He has registered in IIDS through Krishi Vigyan Kendra (KVK) Amadalavala. He got the advisories on pest & disease management, fertilizer management, varieties etc. He has used the text messages as reference to buy the pesticide from dealers shop. Voice and text messages are helpful to protect the crop time to time. Maize crop grown was severely infested with shoot borer. He followed timely advice given by scientists of KVK through IIDS and sprayed the recommended chemicals compared to other maize farmers of the village who were not registered under IIDS. He could able to reduce the cost of cultivation from Rs. 13,000/- to Rs. 11,700/- per ha and reduced sprays from 2 to 1 and got an increased yield of 5 q/ha.

5. Conclusions and Recommendations
The IIDS is very relevant to the agricultural extension functionaries. The information dissemination through Multimedia (Text, Voice, Image and Video) is very appreciable. IIDS can be a better alternative ICT model to the farmers because; from field itself farmer can interact directly with the scientists. As the farmer get the solutions on their mobile itself in local language, even though he is illiterate, if he can’t remember also, he can show the text message to the input dealers to get right inputs from the shops. The personalized advisories to the farmers are more appreciable in this model as the scientist can refer the farm profile and history before providing the solution. It will be a good monitoring tool to the scientists of KVKs to monitor the farmer’s field and it will be a good knowledge management system for knowledge providers and policy makers. During the calamities, the adhoc message facility in IIDS is very useful to the farmers for regular information dissemination. At present, the IIDS model was up scaled in all the districts of Andhra Pradesh and Telangana states in India through Krishi Vigyan Kendras (KVKs) and District Agricultural Advisory and Transfer of Technology Centres (DAATTCs). 36179 farmers were registered, 21030 advisories were given and 3141 text and 1386 voice messages were sent to registered farmers in Andhra Pradesh and Telangana, in view of the vast scope of IIDS services, it is recommended to be replicated in other states of India especially by the state agricultural universities and departments of agriculture.
References