

Designing a Picture-based Agricultural Extension Tool *Krishoker Janala* (Farmer's Window) for Better Agricultural Advisory Service

M. A. Malek¹

Abstract

Farmers are not capable enough to express the problems of their plants before the agriculture extension service provider properly. Therefore, sometimes error occurs in identifying the problem. Consequently, inappropriate suggestions are provided to the farmer. This is due to the existence of communication noises between the farmer and extension worker. Visiting farmer's field involves cost, take time and needs farmer's frequent visit. The problem is bigger when the farmer is a tribe or disabled one. An electronic and device responsive pictorial database (<http://www.infokosh.gov.bd/krishokerjanala/home.html>) of plant's problem found to be very effective in addressing all these issues. It minimizes the communication noises between farmer and extension worker. It is very effective in identifying a problem correctly and providing suggestion appropriately. Farmer/ user can easily identify his/her plant's problem seeing the picture of the database and standardized suggestion comes out on clicking the picture of the problem. The database also found to be very effective in identifying a plant's problem by a tribe or disabled person, who have language problem. Pictures of plant's problems i.e. symptom of insect damage, disease infection and nutritional deficiencies were taken from the field and arranged in the database in a logical order. The database was standardized by a high profile technical expert committee consist of entomologist, plant pathologist, soil scientist, agronomist, horticulturist, agriculture extension expert and information and communication technology (ICT) expert. Several pictures were used to express a problem, so that farmer/ user can easily identify his/her plant's problem. The database is device responsive i.e. it can be used in desktop, laptop, tab and Smartphone. It is usable both online and offline.

Keywords: *Designing, extension tool, problem identification, providing solution*

Introduction

Bangladesh is an agrarian country and its progress in the agriculture sector in last two decades is noteworthy. In this development process, agricultural extension has played a significant role. A number of government organizations (GOs) and non-government organizations (NGOs) provide agricultural extension services to the farmers of Bangladesh. Among the services, providing agricultural advisory services to the farmer is a major one. A study of Katalyst (2011) revealed that from extension service

provider, 83% of Bangladeshi farmers typically seek information on pest management and disease prevention. However, due to the existence of communication gap between the farmers and extension workers, sometimes problems are identified in wrong ways and inappropriate suggestions are provided to the farmers. Rothwell (2004) explained that this type of (communication) noise is caused mainly by the sender i.e., the encoder (in agricultural extension service,

¹Ministry of Agriculture, Department of Agriculture Extension, Upazila Agriculture Officer, Balaganj, Sylhet, Bangladesh (email: malekdae@gmail.com).

the extension worker) due to use of grammar or technical language or jargon that the receiver i.e. the decoder (the farmer) cannot understand. The proposed study shows that this might be *vice-versa* i.e. while sending the feedback, the decoder (farmer) may also use jargons, grammar or technical languages that the extension worker cannot understand. An electronic and device responsive pictorial database of plants' problem can be developed to address all these issues effectively that minimizes the communication noises between farmer and extension worker. Visiting farmer's field and providing suggestions is a good practice but sometime farmer lose his/her output due to delayed field visit and consequently delayed suggestion. This situation can be avoided by using pictorial database through information and communication technologies (ICTs).

The 25,000 strong field force of agricultural extension workers are not equally knowledgeable about all the problems that any farmer might face during the various stages of pre-production, production, and post-production and therefore might suffer from a lack of confidence when suggesting solutions to the affected farming communities. The farmers of Bangladesh do not receive up-to-date and timely information on ways to identify and treat plant diseases, and their lack of formal education means they use crude and inaccurate terms to identify with plant diseases. These challenges have been addressed by *Krishoker Janala* (Farmer's Window), an inexpensive-to-build and inexpensive-to-operate, user-centric indigenous innovation.

The author, then an Agricultural Extension Officer at Fulbaria upazila under

Mymensingh district, with support from the Service Innovation Fund of Access to Information (a2i) project under the Prime Minister's Office, developed a database with pictures of plant diseases and relevant text for accurate identification and easy-to-apply solutions for more than 1,000 diseases for 120 plant types. Named '*Krishoker Janala*', this device-responsive system has equipped the agricultural extension officers as a complementary tool that allows for precise diagnosis of plant problems. Even the farmers and their relatives, with access to smart phone, can download the content in their phones from the existing users or the Digital Centres and use it as and when required.

Service delivery by *Krishoker Janala* started in July 2015 which can be accessed through visiting the official website for the Department of Agricultural Extension and the website for *Infokosh*, a national e-Content repository having the largest pool of livelihood contents in Bangla.

Actually, *Krishoker Janala* is an important tool for agricultural knowledge management. Islam (2010) reported that effective knowledge management is achieved when the right knowledge and information is delivered to the right person at the right time in a user friendly and accessible manner that helps the recipients to perform their jobs efficiently. The outcome of effective knowledge management includes improved productivity and performance of the agricultural sector. *Krishoker Janala* is an effective agricultural extension tool to ensure this. The initiative is also an effective means of transforming agricultural information into knowledge.

Methodology

Designing the tool: The major problems faced by farmer and extension service provider during suggesting a farmer to solve a problem are:

1. Farmers are not capable enough to explain their plant problems properly before the extension worker
2. Sometimes farmers do not bring any symptom of the problem with them
3. Sometimes symptoms are not representative
4. Sometimes symptoms are damaged
5. Field visit is costly and time consuming for extension worker
6. Sometimes due to delayed field visit problem become out of control
7. Communication noises between farmer and extension worker
8. Lack of sufficient knowledge of extension worker about certain problem

To solve all these issues a pictorial database of plant's problem called digital system of plant's problem identification (DPPIS) was designed. Later the system got popularity among the farmer and extension worker as *Krishoker Janala*. Hyper Text Markup Language (HTML) was used to make the database. Several pictures including at least one representative picture of the problem were arranged in the database logically so that anyone can identify his/ her plant's problem seeing the pictures. All the pictures of a problem are linked with the solution of the problem. Solution comes out on clicking the picture identified.

Picture of symptoms of plant's problems were taken from the whole country. Out of 64 districts of Bangladesh, 55 districts were visited to take pictures of various problems of different crops. Growing seasons of all the major crops of Bangladesh were covered during collecting pictures of plant's

problems. The process continued for a period of about two years from 20 September 2013 to 08 September 2015. Pictures were taken just not to illustrate the problem but also to help farmer get similarities with the field problem. Pictures from internet were avoided to make the database user/ farmer friendly ensuring the symptom of a problem, which is shown in Bangladesh's field condition. For a single problem, several pictures were taken. Out of those pictures, representative pictures were selected to express the problem. Symptoms were primarily identified and included into the database with solutions. Then the database was standardized by the technical expert committee. Database includes more than 1,000 problems of 120 crops. Pictures are arranged crop wise. Crops are grouped as field crops, fruits, vegetables, spices, flowers and others. Grouping and picture arrangement were done keeping the farmers' psychology in mind. Confusing crops are grouped as others.

Criteria considered during inclusion of a problem: The problem found at least at three spots of Bangladesh in a growing season.

1. Problem causing financial loss.
2. Distinct problem that can be identified seeing the picture.
3. Farmer's concern about the problem.

Standardization of the database:

Database was standardized by a high profile technical expert committee consist of entomologist (4), plant pathologist (4), soil scientist (2), agronomist (2), horticulturist (1), agricultural extension expert (2) and information and communication technology (ICT) expert (1). Besides several experts of various disciplines and stakeholders were also invited several times at the meeting of

technical expert committee to consider maximum opinion. After inclusion of each one hundred problems of plant in the database, meeting of technical expert committee was arranged and all the newly included problems were presented at the meeting. The Problems and solutions were discussed. After discussing elaborately, the problems and solutions were standardized and finalized. Problem includes insects, diseases and nutritional deficiencies of crops grown in Bangladesh. Development of the database and testing of its effectiveness was continued simultaneously.

Transforming information into knowledge: During taking picture of a problem, relevant information was recorded and farmers were interviewed. At the same time, indigenous techniques practiced by the farmer to address the problem were also noted. The information collected during taking picture was discussed at the meeting of the technical expert committee. Concerned expert shared his/ her experience and good practice of management of a problem were included into the database.

Component of the system: *Krishoker Janala* is actually a system. Previously it was termed as digital system of plant's problem identification (DPPIS). The system has four components, namely

- i) Plant's Problem Image Database (PPID) with solution
- ii) Electronic device
- iii) Service provider
- iv) Farmer

Some criteria for these four components have been identified, which are desired to have the accurate service by the system. Criteria for effective PPID includes- device responsiveness, image quality, inclusion of representative symptom and standardized information etc.. Electronic device can be a computer, laptop or Smartphone. It should

be of reasonable screen size and showing appropriate color. Service provider is desired to be well experienced in the related field and must have experience in using the device and acquainted with the PPID. Farmer should have at least observed the problem himself.

Format of suggestion in *Krishoker Janala*:

When a user clicks on a crop, he/she immediately finds only the pictures of the problem of the crop. Farmer/ user will be able to identify the problem of the crop. The solution will be visible on clicking the picture identified. Solution of problem includes the following information.

1. A very brief description of the problem (while the picture describes broadly)
2. The suggestion: suggestion includes the following:
 - a) Information about what farmers have to do immediately
 - b) Farmer's Behavioral Change Communication (FBCC): This section actually includes some messages to bring changes in farmer's behavior. For farmer's convenience the messages are divided into two head:
 - i) Information on what not to be done next (Don'ts)
 - ii) Information on what to be done next (Dos)

Traditionally, farmers are advised with a list of work to be done ignoring the time and other factors. Farmers get confused what to do immediately. In *Krishoker Janala*, solution of a problem is presented in such a way that farmer will be able to understand what to do immediately and what next.

Features of the database *Krishoker Janala*:

Efforts have been given to develop the database as a user-friendly, device responsive and environment friendly one. It has the following features:

1. Simple, easy to use and user-friendly
 2. Device responsive: *Krishoker Janala* can be used in desktop, laptop and Smartphone
 3. Problems of plants are expressed with pictures
 4. Includes user guide
 5. Includes precautions about using chemical pesticides
 6. Available both online and offline
 7. Standardized solution of plant's problem
 8. Environment friendly
- b) Some messages are tried to be conveyed to the farmer titled Farmer's Behavioral Change Communication (FBCC). These messages are desired to bring a positive change in farmers' behavior encouraging farmers adopt desired farming practices and give up bad practices. Consequently, incidence of pest and disease will be reduced. Ultimately, the need for using chemical pesticides will also be reduced. Because of this, the risk of environment and public health will be reduced.

Public health and environment issues:

These issues have been addressed by the initiative in two ways:

- a) To reduce the indiscriminate use or unnecessary use of pesticides:
 - i) Integrated Pest Management (IPM) techniques or other non-chemical practices of pest management have been suggested.
 - ii) In case of chemical, very specific suggestion have been provided.

Service delivery process through

***Krishoker Janala*:** The folder of *Krishoker Janala* is copied to the electronic device. When a farmer comes to agriculture office or to agriculture extension worker with a problem, he/ she is shown the picture of the crop after primary conversation. Farmer himself identifies the problem of his crop. On clicking the problem, solutions comes out on the screen.

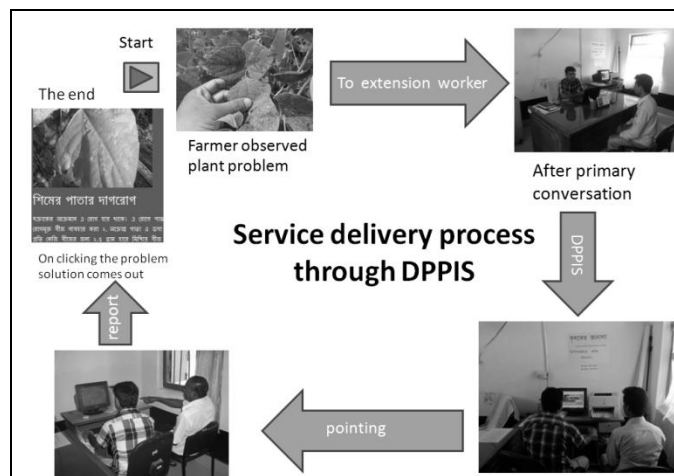


Figure 1 Service delivery process of *Krishoker Janala*

Findings and Discussion

The system was tested in Fulbaria upazila of Mymensingh district in several ways. Farmers were served from various service delivery points like

- i) Upazila Agriculture Office (UAO)
- ii) Farmers' Information and Advisory Centre (FIAC)
- iii) Agricultural Information and Communication Centre (AICC)
- iv) Union Digital Centre (UDC)
- v) Sub-Assistant Agriculture Officer (SAAO)
- vi) Advance farmer using Smartphone or other electronic devices

The service delivery process and the development of the database were monitored by the high officials of DAE.

They expressed their satisfaction and suggest for further improvement. A survey was conducted among the service recipient farmer. 10% of the respondent found to be highly satisfied with this system. They are now user of *Krishoker Janala* in their or their relative's Smartphone or computer. Now they can solve the problem of their own crops as well as the crops of other nearby farmers. 76% of the respondent found to be highly satisfied with this system of service delivery. 10% of the farmer found to be satisfied and 4% of the farmer moderately satisfied but they have claims about presence of service provider and electricity problem.

Conclusion

It could be concluded that *Krishoker Janala* is a very effective agricultural extension tool specially for providing agricultural advisory services to the farmer. It is very important for ensuring unified agricultural extension services. Service recipient farmer's opinion revealed that the satisfaction level of provided service is very high. This system can be scaled up

countrywide. Although the system is developed systematically and effort have been given to make it effective and efficient, the system has some drawback viz. nature of damage or symptom and their management strategies may change in course of time. The database will be updated regularly for ensuring its maximum effectiveness.

References

- | | |
|---|---|
| <p>Islam, F. 2010. Institutionalization of agricultural knowledge Management System for Digital Marginalized Rural Farming Community, ISDA. Montpellier, France.</p> <p>Katalyst. 2011. Media Behaviour of the Poor. Katalyst, Dhaka.</p> | <p>Rothwell, D. J. 2004. In the Company of Others: An Introduction to Communication. New York: McGraw Hill.</p> |
|---|---|