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## Development of an e-Extension Platform to Promote Food Security through Knowledge Sharing

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**Abstract** This paper aims at developing an e-Extension platform towards enhancing agricultural extension services to reduce postharvest losses. The application of ICTs in the agricultural extension related services in Nigeria, just like other sectors such as banks, education, health care and organisations cannot be ignored as it has a crucial impact in making communication easier. Most extension agents depend on traditional means of communication to disseminate agricultural information and research findings to farmers. This approach is inefficacious in the 21<sup>st</sup> century if farmers must achieve food security for the nation. The e-Extension platform is developed to provide the needed information for farmers by automating the duties and activities of the agricultural extension agents. The platform comprises of the following actors; the farmer and the agricultural extension agents who are equipped with adequate ICT skills to respond to farmers comments. The platform is implemented using MYSQL Database Management System for information storage, the Hypertext markup language (HTML) and cascading style sheet (CSS) for webpage design and PHP as the scripting language.

**Keywords** e-Extension, Postharvest losses, Food security, ICT, Platform

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### Introduction

The advent of the internet/intranet and other online services has brought new ways of performing various activities such e-banking, e-learning, e-voting, e-commerce etc. In the last few years, computer and mobile devices have been a great medium of communication in Nigeria. The role of ICT in this modern era cannot be ignored as it has improved and made communication between people easier. The usefulness of ICTs towards the improvement of Agricultural Extension Services, just like other sectors such as banks, education, health care and organizations, has been gaining popularity in Africa and Nigeria in particular. With the rapid development of Information and Communication Technologies (ICTs), data and information can be effectively generated, stored, analyzed, disseminated and used to support farmers and farming communities to improve agricultural productivity and sustainability [1].

The Term “e-Extension” is defined as the use of electronic technologies (especially Information and Communication Technologies) to enhance face-to-face (f2f) and paper-based interactions [2]. It maximizes the use of information and communication technology to attain a modernized agricultural sector. E-extension focuses on creating an electronic and interactive bridge where farmers and other stakeholders meet and transact to enhance productivity. The incorporation of information technology into agricultural extension, involves the integration of diverse technologies, with each capable of positively impacting the efficiency of extension services. ICT as the biggest factor for change in extension service plays important roles in enhancing agricultural extension administration such as helping in producing knowledgeable and well informed farming communities, individually and collectively through diagnosing problems, interpreting data and applying their meanings.



An effective agricultural extension depends on extension messages (information) reaching many farmers and farmers problems reaching extension staff quickly and regularly [3]. The extension agent is the only extension worker who teaches the production recommendations directly to farmers. Through him, therefore, it is expected that the farmer benefits from agricultural research with the ultimate target of raising his agricultural production efficiency and effectiveness.

Various forms of ICT tools abound in Nigeria today and are used by extension workers to improve agricultural extension services. These available ICT facilities according to [4] are grouped into three parts as follows: Broadcast Technology, print technology and Telecommunication/computer technology. Broadcast technology refers to broadcast-media; radio; projectors; media van among others. Print technology include: print media such as newspapers, magazines, newsletters, leaflets. The telecommunication or computer technologies include: global system and mobile system, telephones, computers, fax, internet etc.

ICTs have the potentials of bridging the existing communication gap among the extension workers on one hand and between the extension workers and the farmers on the other [5]. According to [6], ICTs have the potentials to enhance farmers' ability to collate demands; collaborative learning; exchange of time sensitive information e.g. market prices, disease outbreaks, etc. make extension systems and structures more efficient; engage farmers in assessing own needs, solutions; facilitating multi-stakeholder brainstorming; exploring alternative production technologies; facilitating access to markets and credits; training and demonstration; community learning; search, select and compile information for individual clients; early warning for disasters etc. and weather forecast; and peer to peer sharing and exchange among extension

Today, most extension agents depend on traditional means of communication to disseminate agricultural information and research findings to farmers. This approach is ineffective in the 21<sup>st</sup> century if farmers must achieve food security for the nation. If modern ICT facilities are not adequately built into the mainstream of Nigerian agricultural system, there is likely to be stagnation in the dissemination, utilization and application of scientific agricultural information for purposeful development of the system [7]. For this reason, it has become necessary for all stakeholders to join hands in implementing effective ICT policies in Nigeria since it has the potential of mutating agriculture through agricultural extension in the country. This paper focuses at developing an e-Extension platform towards enhancing agricultural extension services to reduce postharvest losses and promote food security through knowledge sharing.

### Methodology

The implementation of our e-Extension platform to promote food security through knowledge sharing was done using MYSQL Database Management System for information storage, the Hypertext markup language (HTML) and cascading style sheet (CSS) for webpage design and PHP as the scripting language. The schematic diagram of the e-Extension framework is presented in figure 1 below.

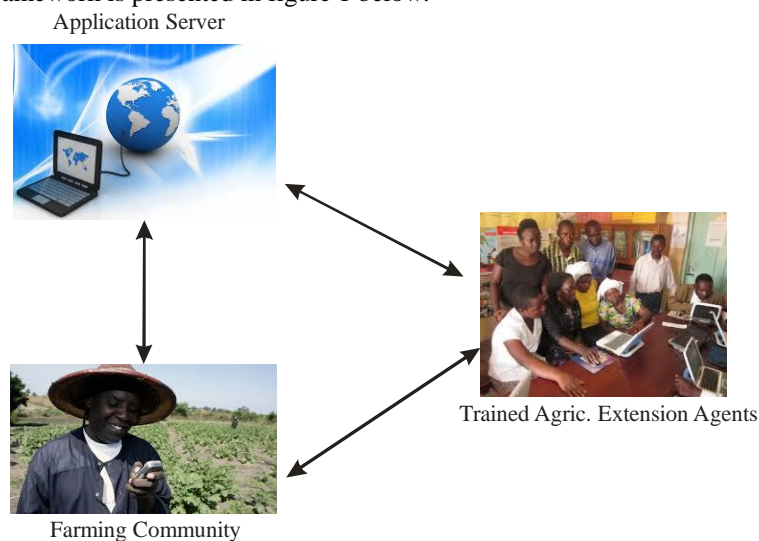


Figure 1: Schematic diagram of the e-Extension platform



The e-extension platform comprises of the following users: the farmers and the agricultural extension agents (AEAs) who are equipped with adequate ICT skills to respond to farmers comments. The application server, which host the developed e-Extension platform that can be accessed by users of the system. The information communicated to the farmers are compiled by AEAs. This information can be accessed directly by the farmers through the application server and the AEAs. The developed platform is meant to enhance knowledge sharing between the farmers and AEAs using various ICT tools.

## Results

The developed e-Extension platform produces physical results; these results are the outcome of the system which is in accordance with the requirement of the developed framework. The outcome or outputs of the system are presented below with each output carrying its title that explains what it does in the system.

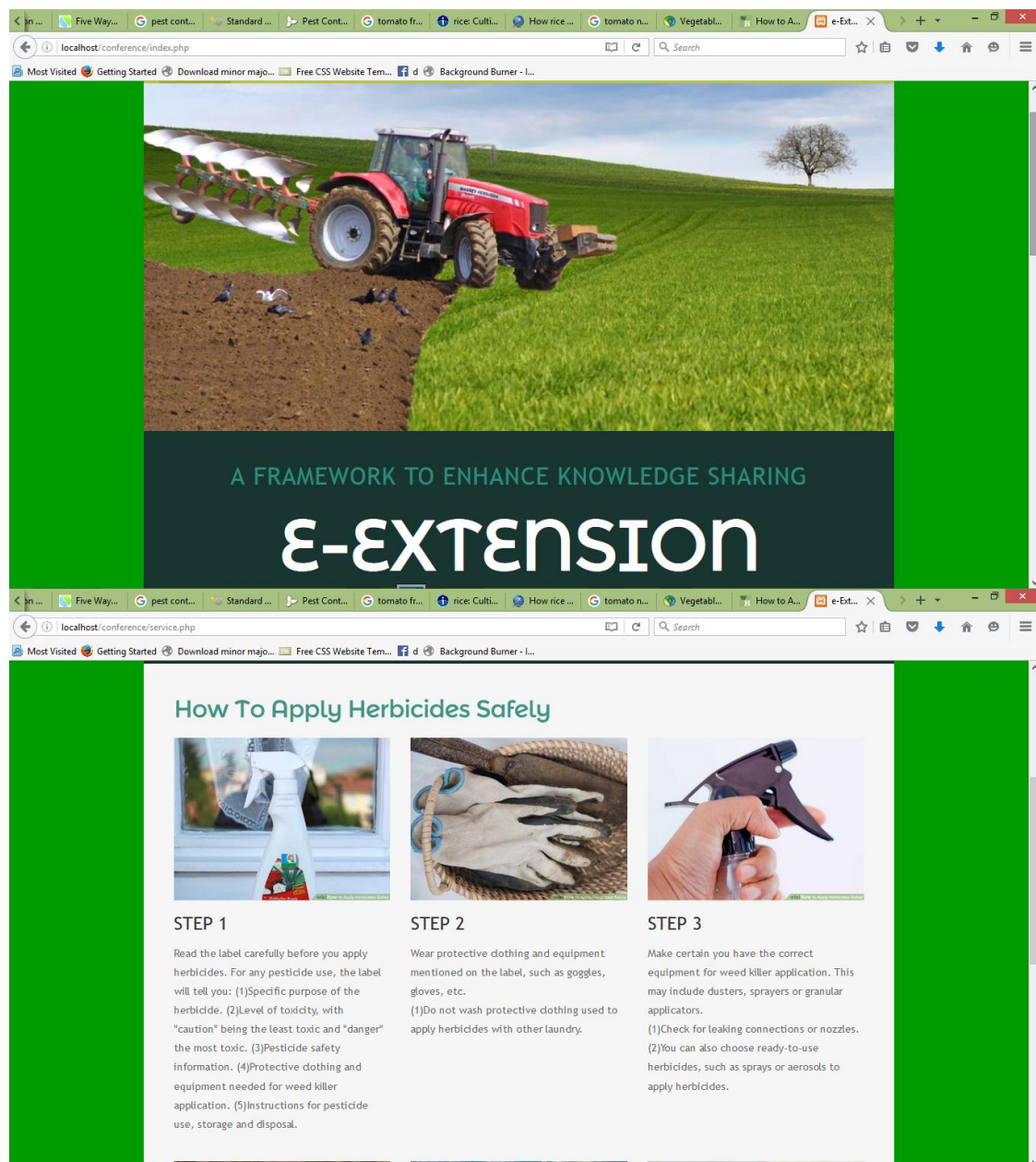


Figure 2: Home page

The figure above shows the home page of the developed e-Extension platform. The home page contains links that connect other pages of the system. It also contains information about different postharvest management practices.

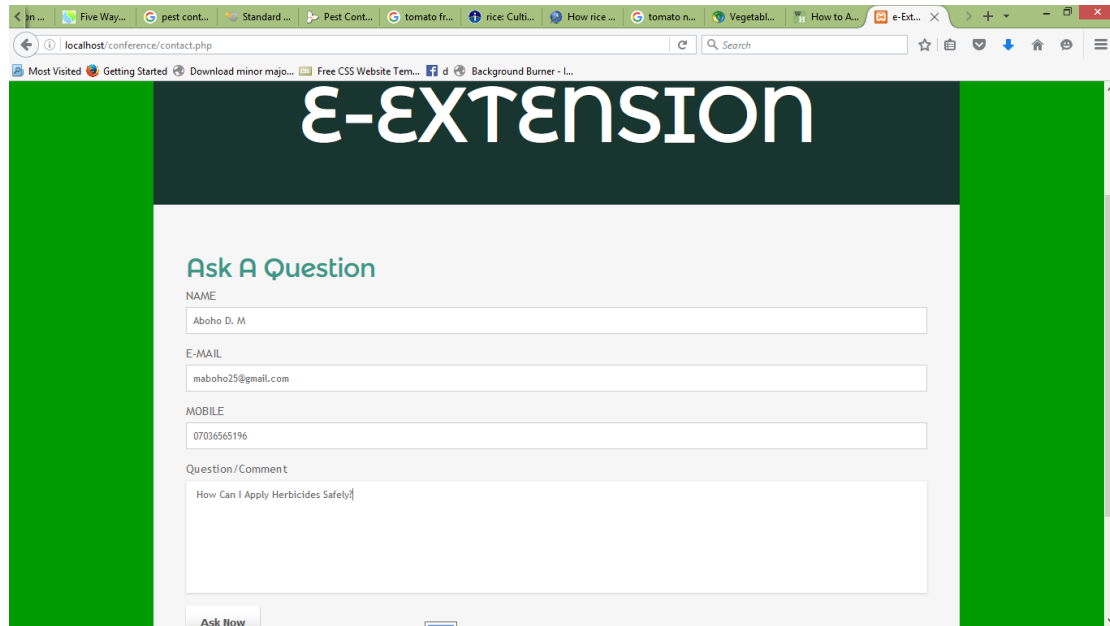


Figure 3: Ask a question page

This page enables interaction between all the stakeholders of the developed framework. It allows farmers and AEAs to ask questions or give comments about different agricultural practices.

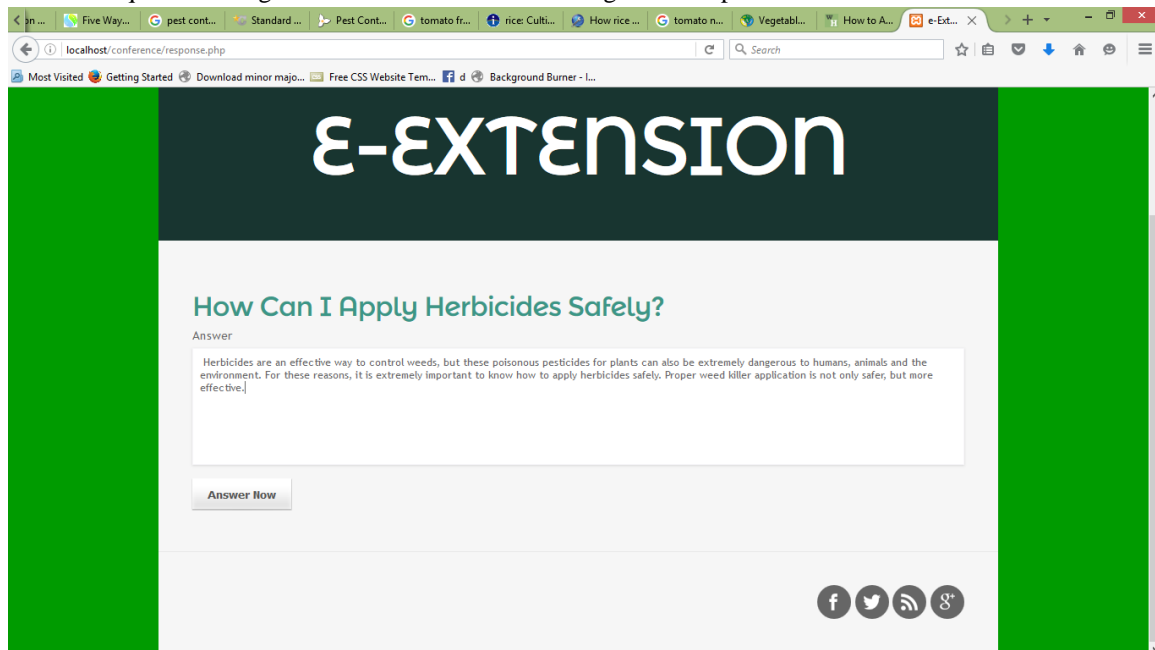


Figure 4: Response Page

The questions asked by different users in figure 3 are then addressed by the AEAs who are equipped with ICT skills.

## Conclusion

This paper presents a platform developed to promote food security through knowledge sharing. The e-Extension platform is developed to provide the needed information for farmers by automating the duties and activities of the agricultural extension agent. The increasing spread of wireless communication technology will positively

affect the introduction of the e-Extension platform in the agricultural sector. If the developed platform is implemented, the system can serve as a simple method that will grant farmers access to complete and concise information on time, improve information flow and connect people within the rural areas, expand outreach to a large number of farmers, obtain market price information, weather forecasts, to mention but a few.

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