THE E-AGRICULTURE INITIATIVE: ACHIEVING THE MDGS THROUGH SHARING OF INNOVATIVE EXPERIENCES

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Abstract

e-Agriculture is relatively new emerging field within agricultural informatics, agricultural development and business. It involves the conceptualization, design, development, evaluation and application of innovative ways to use existing or emerging information and communication technologies (ICTs) in order to boost agricultural production and related activities. The paper discusses how innovative e-agriculture initiatives can contribute to the attainment of the Millennium Development Goals (MDGs) with a specific emphasis on Goal 1 – Eradicate Extreme Poverty and Hunger. It reviews three cases of innovative e-agriculture initiatives – Virtual Extension and Research Communication Network (VERCON) from Egypt, Tradenet.biz from Ghana, and ITC’s e-Choupal from India – and shows how these are contributing to changing the lives of rural-based farmers. Finally, it discusses the Food and Agriculture Organization (FAO)’s e-Agriculture Initiative (e-Agriculture Community of Expertise Forum) whose main goal is to enhance the contribution of ICTs to agriculture and rural development through a multi-stakeholder, people-centred, cross-sectoral platform that brings together all stakeholders from relevant constituencies. It concludes that there is an urgent need to learn and share lessons from various isolated e-agriculture innovations if they are to be scaled up or replicated successfully in other countries. FAO’s e-Agriculture Initiative provides a forum for sharing experiences in e-agriculture. It is contributing to furthering e-Agriculture on a global scale, and thus the attainment of MDG Goal 1.

Keywords: e-Agriculture, e-Agriculture Initiative, Millennium Development Goals, Tradenet.biz, VERCON, e-Choupal

1. Introduction

1.1. Millennium Development Goals and Agriculture

In September 2000, at the United Nations headquarters in New York City, representatives of the UN member states adopted the Millennium Declaration as a re-
newed commitment to human development. The declaration, later consolidated into 8 goals (better known as the Millennium Development Goals), 18 targets and 48 indicators, became a formal commitment by the international community to fight against poverty and hunger, disease, illiteracy, environmental degradation and discrimination against women by the year 2015.

The Millennium Development Goals (MDGs) consolidated from articles 19, 20 and 21 of the Millennium Declaration (United Nations 2000) are the following:

- Goal 1: Eradicate extreme poverty and hunger
- Goal 2: Achieve universal primary education
- Goal 3: Promote gender equality and empower women
- Goal 4: Reduce child mortality
- Goal 5: Improve maternal health
- Goal 6: Combat HIV/AIDS, malaria and other diseases
- Goal 7: Ensure environmental sustainability
- Goal 8: Develop a Global Partnership for Development

About 70 percent of the MDGs’ target group live in rural areas, particularly in Asia and Africa (Rosegrant et. al. 2006.), and a large number of the people in this group depend largely on agriculture (encompassing crops, livestock, aquaculture and fish, forestry and agroforestry) for their livelihoods. About 75% of 1.3 billion people living on less than $1/day live in rural areas. Therefore, agriculture and rural development are vital for achieving the majority of MDGs, and progress on these goals can in turn advance agriculture and rural development (CGIAR & IFPRI 2002). A more productive and profitable agricultural sector in the developing countries of Asia and Africa could contribute immensely to the achievement of the MDGs, especially Goal 1.

1.2 MDGs and Information Communication Technologies

It is now widely recognized that the use of information and communication technologies (ICTs) – encompassing the “old” ICTs of radio, television and telephone, and the “new” ICTs of computers, satellite and wireless technology and the Internet (UNDP 2004) – can foster the implementation of development goals, and in 2003, the United Nations ICT Task Force established a link between most of the targets related to the MDGs and information and communica-
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tion technologies (United Nations ICT Task Force 2003). The UN Millennium Declaration also recognized the role that ICTs could play in enhancing development and this is indicated in Goal 8, under Target 18 which outlines a focus on cooperation with the private sector to ensure that the available benefits of new technologies, especially information and communication technologies are available to all. ICTs have a role to play in contributing towards combating poverty, hunger, diseases, illiteracy, environmental degradation and discriminations against women.

Regarding **Goal 1 – Eradicate Extreme Poverty and Hunger**, ICTs have the potential to increase agricultural production which could result in improvement in the quality of lives in rural areas and this could contribute to the eradication of extreme poverty and hunger among the rural populations. If properly deployed, ICTs could enable rural-based farmers to access information and knowledge that could lead to improvements in the farming methods and processing of their produce, access up-to-date information on prices of their produce, and sell their produce to external markets. The challenge for governments, private sector, civil society and other stakeholders in developing countries, therefore, as declared by the World Summit on the Information Society (WSIS), “is to harness the potential of information and communication technology to promote the development goals of the Millennium Declaration” (WSIS 2003). ICTs have enormous potential as tools to lift the marginalized, rural poor people in developing countries out of poverty, which according to the Department for International Development (DFID):

> “has multiple and complex causes. The poor are not just deprived of basic resources. They lack access to information that is vital to their lives and livelihoods: information about market prices for the goods they produce, about health, about the structure and services of public institutions, and about their rights. They lack political visibility and voice in the institutions and power relations that shape their lives. They lack access to knowledge, education and skills development that could improve their livelihoods. They often lack access to markets and institutions, both governmental and societal, that could provide them with needed resources and services. They lack access to, and information about, income-earning opportunities” (DFID 2002).

Therefore, as part of a wider strategy to eradicate extreme poverty and hunger, rural populations in developing countries should be empowered to access information and knowledge that is vital to their lives and livelihoods, and to use ICTs
as a tool to support their efforts to lift themselves out of poverty (WSIS 2003). Considering that 75% of the world’s poor live in rural areas and 85% percent of them are directly or indirectly involved in agriculture, the application of ICTs to the eradication of extreme poverty and hunger must take into account the needs of the rural populations.

2. Innovative ICT Application in Agriculture (e-Agriculture)

E-agriculture involves the conceptualization, design, development, evaluation and application of innovative ways to utilize existing or emerging ICTs (Mangstl 2005) in order to boost agricultural production and related activities. Examples of e-agriculture applications include the delivery of agricultural information and knowledge services, i.e. market prices, extension services, information on agricultural practices, soil condition and weather condition, etc, using the Internet and related technologies, and the more advanced applications such as using sophisticated ICTs, i.e. satellite systems, Global Positioning Systems (GPS), Geographical Information Systems (GIS), advanced computers and electronic systems, to improve the quantity and quality of agricultural production.

Efforts to harness the potential of ICTs in agriculture and contribute to the realization of the MDGs, especially Goal 1, are resulting in several innovative e-agriculture initiatives by various stakeholders, i.e. private, public, civil society, international non-governmental and governmental organizations, etc, in various parts of the world. The following are just three of the innovative e-agriculture initiatives that have been implemented and are operating successfully:

- Tradenet.Biz – Ghana
- Virtual Extension and Research Communication Network – Egypt
- ITC’s e-Choupal – India

2.1 TradeNet.biz

TradeNet.biz (http://www.tradenet.biz), developed by a team of young Ghanaians at BusyLab, a software research and development business based in Accra, Ghana, is a customizable, web based platform offering online tools for the exchange and management of market information. It is designed to be used by farmers’ associations and commodity traders in developing countries. Its major goal is “to make African markets more transparent and efficient, improve intra-regional trading, and provide stakeholders with enough recent and accurate in-
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formation to make better decisions on bringing products to market and at what price” (BusyLab n.d)

The platform offers the following facilities which were developed in consultation with market price analysts, farmers, traders and agricultural specialists:

- Six modules for managing price information, document library, news, offers, contacts, and commodity information;
- Space for producer and trader organizations to create websites which can incorporate information from the above six modules;
- Access to information using Short Message Service (SMS) available on digital mobile phone networks;
- Facilities for users to configure local measures, i.e. sacks, bowls, bags, etc and specify a metric conversion and upload or display prices in local measures.

Fig. 1: TradeNet.biz website

![Image of TradeNet.biz website](https://example.com/image.jpg)

1 Website screen captured on 19 April 2008.
TradeNet.biz is a result of public/private partnerships. During the pilot phase in 2003, which focused on providing market information on Shea butter, TradeNet.biz received initial support from FAO and TechnoServe Ghana, while its major development phase was conducted in partnership with the regional project “Market Information Systems and Traders’ Organizations of West Africa” (MISTOWA), a USAID West Africa-funded managed by IFDC2. Other partners included the International Center for Tropical Agriculture (CIAT); FoodNet, a post harvest and market research programme of the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA); and Areeba3, a mobile phone service provider based in Ghana.

TradeNet.biz, launched on 30 January 2007, is covering over 300 major markets in West and Eastern Africa, and the primary users of the platform are MISTOWA’s partner organizations, associations of farmers, producers, and market information networks in almost all the 15 Economic Community of West African States (ECOWAS) countries4. Under the MISTOWA project, TradeNet.biz provided the technology side of a solution to the challenge of improving market information flows in West Africa, a region in which lack of access to market information has been a major barrier to trade and food security. MISTOWA has trained government and private market enumerators to upload price and other information to Tradenet.biz, producer and trader organizations to access the information and develop their own websites on the platform, and helped partners create and manage on a for-profit basis Agribusiness Information Points (ABIPs) where information can be uploaded and accessed. The platform, accessed via SMS, fax, web, and Personal Digital Assistants (PDAs), is allowing potential traders and buyers to have access to daily price information of goods, identities of potential buyers and sellers, post buy/sell offers to the community, download video/audio files, access research documents.

Outside the West Africa sub-region, the TradeNet.biz platform is available to users in Madagascar, Mozambique, Rwanda, Tanzania, Uganda and it has also been piloted in Honduras, in South America. TradeNet.biz has the potential to become a continent wide platform for market and trade information in Africa and could contribute to opening up agricultural trade among countries in Africa and putting more money in the farmers’ pockets.

2 An International Center for Soil Fertility and Agricultural Development
3 Changed the name to MTN as from August 2007
2.2 VERCON – Research and Extension Network

The Virtual Extension and Research Communication Network (VERCON), is a process and conceptual model for improving communication between research, extension and farmers developed by the FAO. VERCON aims to harness the potential of the Internet and apply it to strengthening and enabling linkages among the research and extension components of the national agricultural knowledge and information system. The VERCON’s innovative nature is its capability to achieve effective linkages by connecting geographically dispersed people and enhance two-way communication, managing large volumes of data, and rapidly collecting, processing and dispersing information in a variety of forms (FAO n.d).

The VERCON concept has been implemented in Egypt. The pilot implementation, with the support of FAO’s Technical Cooperation Programme, was done in 2001-2002 in collaboration with several national organizations including the Egyptian Central Laboratory for Agricultural Expert Systems (CLAES) and the Agricultural Extension and Rural Development Research Institute. The official launch of the platform (http://www.vercon.sci.eg/vercon_en/) was in April 2003.

The overall goal of the VERCON implementation in Egypt is “to improve, through strengthened research-extension linkages, the agricultural advisory services provided to Egyptian farmers and in particular to resource poor farmers in order to increase production in food and agriculture with the goal of raising farm incomes” (What is Vercon? n.d.). The platform in Egypt provides authorized users access to:

- Expert/decision support systems for wheat, rice, beans, grapes and tomato;
- Digitized extension brochures and bulletins produced by research institutes and central administration for extension;
- Statistical databases.

The platform also provides access to growers’ problems system that enables extension workers to interact with researchers at different levels, and keep a repository of all problems raised by the farmers and the solutions; and unsolved problems, if any, to be referred to researchers to find solutions to them through their research programmes (Rafea 2004). It also facilitates communication between researchers and extension workers through online discussions, and announcements of news and events pages.
2.3 ITC’s e-Choupal

The e-Choupal\(^6\) initiative (http://www.echoupal.com/) is well documented. e-Choupal is a private company initiative in which Internet kiosks (e-Choupals) for e-commerce are being used to enable farmers in rural Indian villages to access crop-specific, customized and comprehensive information in their own language on websites that ITC has created. The initiative, launched in June 2000 by ITC’s International Business Division, one of India’s largest exporters of agricultural commodities, provides farmers with access to content that includes expert knowledge on best farm practices, prevailing Indian and international prices and price trends for their crop, risk management and farm insurance, and local weather forecast.

\(^5\) Website screen captured on 19 April 2008.
\(^6\) Choupal means village meeting place in Hindi
Under the e-Choupal initiative, ITC has set up Internet kiosks in villages which are managed by farmers known as ‘Sanchalaks’ (coordinators), selected from within the community. The ‘Sanchalaks’ are trained to run the e-Choupa and they help the farmers to access the different agricultural crop-specific websites that ITC has created in the relevant local language. The ‘Sanchalaks’ also facilitate the ordering and supply of high-quality agricultural inputs such as seeds, fertilizers offered by the participating partner companies.

The e-Choupal initiative initially started as an effort to re-engineer the procurement process to facilitate sourcing of high-quality farm produce (i.e. soy, tobacco, wheat, shrimp, and other cropping systems) for ITC’s fast growing agribusiness in rural India. It was designed to tackle the challenges posed by the unique features of Indian agriculture, characterized by fragmented farms, weak infrastructure and the involvement of numerous intermediaries, among others (ITC n.d.). The initial objectives of the initiatives were to (Bowonder, Gupta & Singh n.d):

7 Website screen captured on 19 April 2008.
• enhance farm productivity by disseminating latest:
  o information on district level weather forecasts for short and medium terms
  o information on best practices in farming (generic as well as specific)
  o information supply of quality inputs (seed, herbicide, fertilizer, pesticides etc) in the village itself

• improve price realization for farm produce by making available:
  o live data on markets viz. location/buyer wise prices offered
  o international market prices of relevant agri-commodities
  o historical and up-to-date information on supply and demand
  o expert opinion on expected future price movements

• minimize transaction costs in marketing farm produce:
  o by buying output at the farmers’ doorstep
  o through transparent pricing & weight management practices

Since its launch, it has gone on to become the largest initiative among all Internet-based interventions in rural India. By May 2007, e-Choupal services were reaching more than 4 million farmers in about 40,000 villages through more than 6500 Choupals across eight States of India, and farmers’ incomes in the areas covered by the initiatives had increased by 20% and productivity increased from 14% to 29% (ITC 2007).

3. The e-Agriculture Initiative

There is an urgent need for a platform to promote innovative e-agriculture initiatives taking place in many parts of the world, and to share experiences. If brought together in a more coherent and systematic way, the wide range of enterprises will have greater potential impact by learning from each other than if they remain isolated or fragmented. In this regard, at WISIS Phase I in Geneva in 2003, FAO launched its partnership-based Bridging the Rural Digital Divide (BRDD) programme which addresses the first Millennium Development Goal, eradicating extreme hunger and poverty, and the Plan of Action of the World Summit on the Information Society, which undertakes to build a people-centred, inclusive and development-oriented Information Society (FAO 2006). The objectives of the Programme are:

• to increase the availability of information content related to rural areas in digital form;
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• to develop innovative mechanisms and processes for information exchange and communication; and

• to establish networks and communities of practice in information and communication for development and for exchange of information on agriculture and rural development

In 2005, at WSIS Phase II, the Organization launched an interactive website – www.fao.org/gil/rdd – for the Programme which is being used to promote best practices in e-agriculture; provide a range of approaches to information and communication for development and illustrative case studies; provide access to tools for capacity building; links to community practice; and news and other resources.

Fig. 4: BRDD website

8 Website screen captured on 19 April 2008.
The need for a platform to share innovative e-agriculture experiences was also supported by the results of a global online survey on e-agriculture, conducted from 1 October to 15 November in 2006 by the FAO, as a follow-up to the World Summit on the Information Society. In the survey, a total of 2121 participants (62% of the 3,433 respondents) from 135 countries requested to be part of an e-Agriculture Forum. Based on the request made by the survey participants, the FAO, which has been assigned the responsibility of organizing activities related to the WSIS Action Line under C.7 ICT Applications on e-Agriculture, on 28 September 2008, launched an e-Agriculture Community of Expertise forum. The goal of this initiative is to enhance the contribution of ICTs to agriculture and rural development through a multi-stakeholder, people-centred, cross-sectoral platform that will bring together all stakeholders from relevant constituencies (FAO 2007). This forum will foster:

- focused online dialogue and knowledge exchange;
- development of good practice guidelines;
- creation of opportunities to find and interact with other practitioners around the world; and
- sharing resources and build relationships that can be applied to shared projects.

The e-Agriculture Community of Expertise will (FAO 2007):

- identify stakeholders, individuals and organizations (e.g. farmers groups etc), that might wish to take part in the Community;
- enable regional, national or local sub-communities to be developed;
- host Forum discussions to enable sharing of knowledge on topics related to e-agriculture and to foster collaboration;
- contribute towards the development of policies, guidelines, strategies and priorities related to e-agriculture and to advocate sound practices;
- share documents, resources and experiences (case studies) with other members in this global community;
- generate news feeds that help to promote the Community and advances in e-agriculture;
- allow stakeholders to promote themselves and their experiences.
The overall aim of the forum’s portal, www.e-agriculture.org, which was pilot launched on 23 May 2007, is to enable members of the e-Agriculture Community of Expertise to exchange opinions, experiences, good practices and resources related to e-agriculture, and to ensure that the knowledge created is effectively shared and used. The portal provides access to a forum for registered members, news and events and to a collection of global examples of e-agriculture related projects and initiatives.

Fig. 5: e-Agriculture Forum website

4. Conclusion

If properly used, information and communication technologies have great potential to effectively contribute to achievement of the Millennium Development Goals, particularly those related to income poverty reduction, health, education, environment and gender equity. As seen in the three cases of innovative e-agriculture approaches briefly discussed in this paper, ICTs can facilitate the

Website screen captured on 19 April 2008.

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creation of economic opportunities and opening up of markets to farmers. Timely access to relevant information and knowledge, made possible by both old and new ICTs, on improved farming practices, agricultural inputs, weather conditions, local and international prices for agricultural commodities, government agricultural policies, etc can result in improved and increased production and sale of more farm produce by the farmers. This in turn can bring in extra income and ultimately contribute to poverty reduction.

Several isolated innovative e-agriculture projects are being implemented in many parts of the world. There is an urgent need to learn and share lessons from these innovations if they are to be scaled up or replicated successfully in other countries. FAO’s e-Agriculture Initiative provides a forum for sharing experiences in e-agriculture. It is contributing to furthering e-Agriculture on a global scale, and ultimately to the attainment of MDG Goal 1.

References


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