RESOURCE MANAGEMENT

ISSUE

Find a Silver Lining for Farmers

Information and Communication Technology for Food Security and Sustainable Agriculture

The world, overall, is struggling hard to eradicate poverty, but the Asia-Pacific region especially has been experiencing the worst problem with a skyrocketing population and low yields of food production. Also, the region has suffered from poor management of land and water resources, under-educated laborers and major disasters. In order to settle these issues, it is important for Asia-Pacific countries to concentrate on agricultural production considering that the industry takes up a high portion with mostly Asia-Pacific nations and the percentage of agriculture population is high. As The World Summit on the Information Society (WSIS) in 2003 put priority on agricultural development through application of ICT, ICT carries hope to people living in these areas, although many obstacles related to connectivity and accessibility to ICT still remain.

Conventional ICT Use in Agriculture

In this information society, agriculture also transformed from being a labor-intensive industry into an information-intensive model. There are four areas in which conventional ICT is used in improving agriculture production: nutrition; marketing and distribution of agricultural produce; e-government; and monitoring and forecasting of climate, weather and crops.

1. Nutrition

ICT is used in monitoring nutrition status. Examining and mapping food insecurity and vulnerability information are becoming increasingly important, because they are useful in setting strategies in the face of threats.

2. Marketing and Distribution of Agricultural Produce

The use of ICT expands the potential to get information, thereby reducing uncertainty in the market. In this way, ICT enables markets to function better and the availability of food also increases, naturally leading to income increase. Several examples of this kind of ICT use can be found in India's Agmarknet (Agricultural Marketing Information Network), Pondicherry's local "knowledge centers," and e-Choupal[i] model. All these systems provide farmers with weather conditions, market prices for commodities as well as good practices in agriculture.

Also, ICT is beneficial to distribution system related to transportation infrastructure. In the past, one-vehicle trucking business used a telephone to locate a destination or secure a return load. But the system is replaced by larger businesses with sophisticated radio system to locate and identify vehicles automatically and transmit posting instructions from a central control location. A better distribution system also is advantageous in solving the food shortage problem. With information on food stocks and effective use of limited transportation facilities, isolated regions having a hard time with lack of food will be saved.

3. e-Government

Since ensuring food security entails complex tasks to deal with such as agriculture, nutrition, gender and technical issues, various ministries have to engage in the problem-solving, streamlining and coordination of the flow of information. Additionally, timely and accurate information is needed by the right decision makers. e-Government is the one way to elevate policymaker's capabilities through real-time communications.

4. Monitoring and Forecasting of Climate, Weather and Crops

Through ICT, farm yields are now augmented because of the possibility to monitor and forecast climate, weather and crops, integrate forecast with strategic preparation enabling immediate response from ministerial to the farm level, promote international, social and corporate responses and implement precision farming. Observing more closely, ICT contributes to three stages of monitoring and planning in agriculture. First, in terms of forecasting cropping conditions, farmers are able to absorb such information and prepare for the growing season by selecting the right plants. Second, ICT enables farmers to determine appropriate interventions during cultivation. Also, in the context of the disaster-prone feature of the Asia-Pacific region, weekly or 10-day weather forecasts are highly reliable and helpful. Lastly, it is on weather and crop conditions just before and during the harvest on which agricultural success depends. ICT can maximize harvesting-to-storage or -shipping conditions.

Modern ICT Use in Agriculture

1. Bioinformatics

Bioinformatics is a mixture of ICT, computer science and biology. Initially, the focus was to create and maintain a database in order to accumulate biological information. Now, the experiment has stretched to analysis and interpretation of various types of biological data such as genome sequencing.

2. Precision Farming

Precision farming utilizes technologies to collect and analyze data for the assessment of variations in soil and climate conditions. The measure needs to apply technologies including Global Positioning System (GPS), sensors, satellite or aerial images, and information management tools to collect information on optimum sowing density, fertilizers and other input needs.

3. Farm Automation

Farm automation indicates the adoption of computers in farming control systems to increase the production with more predictable results.

4. Space Seed Program

In order to multiply farm production, there also needs to be investment in amelioration of seeds. The agricultural community works with satellite companies in the space seed program in order to make seeds

with more fruits and vitamins, sweeter taste and longer shelf life. Rice, cotton, oil seeds and various vegetables have been sent into space for this purpose.

5. Biotechnology and Crop Technology

In terms of biotechnology, genetic modification and manipulation has been performed by advanced plant breeding technology. As a result of applying this technology, crops with many beneficial traits have come out in the market. As to crop technology, crops that are more tolerable to herbicide, viruses and fungi and have better quality have been developed so that maize, soybean, rice and tomato, etc., are genetically modified.

Holding Hands

As e-Choupal in India has shown, cooperation between private companies, state universities, and government is greatly needed in order to bear fruit in applying ICT to agriculture. This program certainly bolstered farmers' expertise and enhance day-to-day awareness of what needs to be done to meet agricultural needs. The Grameen Phone International Development Project also succeeded in building community e-centers and disseminating agricultural information to farmers in their native languages with the assistance of WIN Incorporate. Likewise, collaboration among private and public sectors carries significance.

With respect to the public sector, e-government matters the most primarily. Government has to be well-prepared and have the ability to effectively distribute relevant content, including crop cultivation technology, inputs, soil and fertilizer dosage. Also government has the responsibility to organize necessary infrastructure as well as develop connectivity and accessibility. On the other hand, the private sector has the obligation of offering efficient, high-quality commercial services as well as discovering a profit model while recognizing social importance.

In 2007, the e-Agriculture Community of Expertise initiative was launched by Food and Agriculture Organization (FAO) with the purpose of activating information exchange and communication processes for the e-agricultural community through the measure of virtual communities and networks, ICT-use capacity, and increased accessibility to statistics as well as information on the market and farming techniques. The outcome rests on the extent to which all stakeholders participate.

Looking Ahead

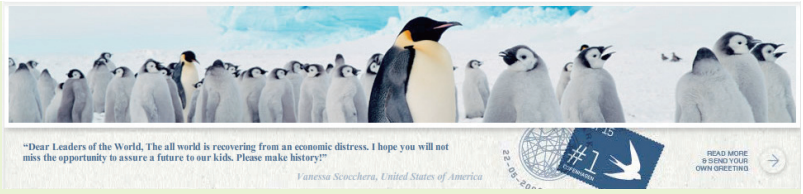
Among all these, what needs to be done in the first place is for government to be equipped with a sound, market-oriented ICT regulatory framework, incentives to encourage investor involvement, international standards and ICT-based monitoring and forecasts, as well as initiatives to combine existing media channels with ICT. Furthermore, to advance efficiency and to yield more practical outcomes, it is necessary to draw regional cooperation. Many nations already facilitate agricultural expert systems, the online networks that prop up information on agricultural production, marketing, technological development, weather forecasts and disaster management. Training courses on precision framing, farm automation and the like are also provided. However, it is necessary for Asia-Pacific nations to share knowledge and good practices that they have learned through those projects by holding workshops and seminars. Especially, for the reduction of disaster risk, many countries in the Asia-Pacific region have set up national systems. However those systems operate in the boundary of limited membership and coverage. Consequently, it is highly suggested to form a regional system of networks for information sharing and analysis for disaster risk reduction. ICWT

Footnote

[i] e-Choupal is an initiative of ICT Limited, a large multi business conglomerate in India, to link directly with rural farmers for procurement of agricultural produce like soybeans. e-Choupal was conceived to take the challenges by the unique Indian agriculture, such as fragmented farms, weak infrastructure and numerous intermediaties. source: http://en.wikipedia.org

About the Article

This article is drawn from *Information and Communication Technology for Food Security and Sustainable Agriculture in the Knowledge Economy* by UNESCAP, which was presented at the World Summit on the Information Society Five Years On: Information and Communications Technology for Inclusive Development, held in Nov. 2008. at Thailand Mainly, the document presents the reason for ICT use in agriculture in Asia-Pacific nations, the way ICT is used in agriculture, the necessity for public-private partnership and recommendations for stakeholders.



Messages from the Copenhagen Climate Conference

The Copenhagen Climate Conference was held from 7 to 18 December 2009. This conference carried special significance in that it would produce the new treaty replacing the Kyoto Protocol, which was adopted in Kyoto, Japan, in December 1997 and entered into force on 16 February 2005.

After the conference, the Copenhagen participants produced a Copenhagen Accord, even though the document did not explicit ICTs but implicitly referred to "future technologies, coordination and development of new technologies." This can be considered as a significant step forward in that the UN publicly stated the ICTs not only as a causing factor of climate change but as a solution in a limited scope.

ICTs' role as a solution to climate change was obviously demonstrated at the 15th conference. The International Telecommunication Union (ITU) especially took an active part in the conference onsite for the two-week period in order to strengthen the awareness of the significance of ICTs as well as to support action on climate change by various agents. At the UNFCCC iSeeT@theClimateChangeKiosk, daily Business Talks by leaders in the ICTs sector from both the developed and developing was held. The Kiosk highlighted the role of governments, the private sector and civil society on such matters as how ICTs are used to help reduce greenhouse gas emissions by replacing unnecessary air travel. In making progress, telepresence technology, the Internet, LCD screens and the networked laptop were used along with the UNFCCC Website where the concerned are able to demand for Webcasts.

During the conference, side events other than ITU's were prepared. There were sessions on climate visualization giving insight into the usage of visualization tools in tackling climate change, Smart Grids for saving energy and protecting the environment - the role of regulation, a Climate Change Solution: Realizing the Potential of Carbon Dioxide Storage, and etc. More activities such as Copenhagen Business Day, the exhibition "In the Eye of Climate Change," Bright Green, Urban Climate Solutions Tour, Seminar on climate change adaptation, and a high-level roundtable debate called "Risks, insurance and investments - supporting low carbon energy technologies" were organized.

The international conference had the use of ICTs in a global debate on the key environmental issues against the earth through CNN and YouTube, and offering the opportunity for virtual conferencing supported by Cisco.

For more information, visit:
http://en.cop15.dk/frontpage
http://unfccc.int/2860.php
http://www.behindthegreen.org