

The Role of Information and Communication Technologies (ICTs) in the Improvement of Agricultural Value Chains

Agricultural value chains are heterogeneous associations of primary producers and other economic agents who aim at improving performance and economic productivity in the market. They differentiate by their technological structure, size of business, educational level and means of access to information.

Exchanging information is critical for stakeholders in agricultural value chains due to its nature, as it is the key element for establishing, developing and managing efforts to improve their competitiveness in local and international markets. In this regard, Information and Communication Technologies (ICTs) are effective tools and in several cases, also innovative to facilitate the exchange of information in the value chains.

The agriculture in Latin America and the Caribbean is characterized as one of the most diverse sectors of the economy, which determines the use of ICTs. The former depends largely on the types of products (primary or agroindustry output, etc.), the stakeholders, (their level of education, economic capability, ability to adapt and the means to access new technologies, etc.), as well as the geographic location where the value chains are developed (rural, semi-urban and urban).

ICTs certainly play a key role to contribute to reduce asymmetries of information and communication between stakeholders of an agricultural value chain, and to help reduce the vicious circle of rural poverty. However, the positive impact that ICTs may play in agricultural value chains depends in large part on the boost of supportive public policies and innovative initiatives in the use of ICT that tend towards equitable access to the most socially-disadvantaged and vulnerable groups in rural communities, particularly, agricultural producers, as the fundamental link in the value chain.



Credit: Perú-Telefónica

Scope and Impact

It has been acknowledged that application of ICTs at the different links of the agricultural value chain will result in improvements to the competitiveness of the chain in general. In a broad sense, the access to and the management of technological information (price and market information, weather conditions, economic variables, communication with peers and business transactions, post-sale services, etc.) are very important factors in achieving competitiveness.

Several practical benefits have been noted in different food value chains with reference to the use of ICTs to improve market transparency and to reduce transaction costs of intermediaries, that will benefit different agricultural production activities and their producers specifically. Similarly, improvements through ICTs at the primary activities will also have a positive effect on the entire agricultural value chain.

Several experiences in the region provide examples to demonstrate how rural communities, and specifically smallholder farmers benefited from the use of ICTs. In Uruguay, the CEIBAL Plan facilitates the digital inclusion of small communities. In rural areas, the integrated use of ICT in meteorological centers improves the quality of information provided to farmers, who in this way, are able to plan crop production based on accurate and timely climate information, which ultimately increases productivity; for example, in Chile (REDAGROCLIMA) offers weather-alerts by e-mail and SMS to mobile phones of producers and farmers.

In Central America and the Dominican Republic a platform has been developed, offering market information for fruit value chains in the region. In Costa Rica the interactive platform PLATICAR promotes the exchange of information using ICTs to support knowledge management, offering various online services. The new technological conditions imposed by the market, including ICTs, also lead to the need to change the relationship between the different levels of the agricultural value chain. In Argentina, the National Health and Quality entity (SENASA) uses new ICTs in their systems for traceability and food safety, which leads toward new relationships among stakeholders.

Factors to Consider

Given the heterogeneity of the stakeholders in an agricultural value chain, the roles that ICTs can play in each of the levels of the chain may be influenced by factors such as:

- Infrastructure for access and ICT affordability, including Internet connectivity in production and commercial areas. For example, in Chile and Peru, only 10-11% (estimated) of rural population has access to Internet;



Credit: F. Martin

- 👉 Higher concentration and usage of ICTs –up to date and innovative technologies- in sectors with more economic power;
- 👉 The quality and availability of information content;
- 👉 Limitation of the media itself;
- 👉 Individuals' choices and their appropriation of ICTs;
- 👉 Support services and training to develop the “culture of use” of ICT and “information literacy” among chain stakeholders;
- 👉 The potential “virtual” relationship between stakeholders in the food value chain may have a counterproductive effect in the negotiations and relationships that have been based on trust and face to face interaction (cultural factors).

Perspectives for the Future

The implementation and increasing use of ICTs in most aspects of daily life is irreversible; and while options are more ample and sophisticated in certain levels of agricultural value chains, agricultural producers have increased and improved access to new ICTs, gaining in this way also wider access to information on markets, weather, etc.

Governments should promote policies to reduce the digital divide by opening the telecommunications market, as well as supporting legislations to regulate competition and the development of infrastructure to facilitate ICT access to rural areas. It is essential to promote public policies, programs and innovative public and private initiatives that foster equal access to ICTs and to vital information needed by different agricultural chain stakeholders for making economic and environmental decisions, especially, the social-disadvantaged groups in isolated and remote rural communities.

Several experiences in Latin American and the Caribbean (e.g. Uruguay and Chile) show the importance of promoting public policies and fostering partnerships (public, private and civil society) to reduce the rural digital divide and to improve the competitiveness in value chains; while expanding access to communications infrastructure, developing services and content focused on value chains, promoting a “culture” for the appropriation of ICT in rural areas and developing “information literacy” from primary education. In addition, it is beneficial to promote the exchange of experiences between producers and agro-entrepreneurs in the use of ICT to improve their processes.

Currently, joint efforts among government agencies are developing pilot projects and also provide training in the use of ICTs. The private sector is and will be one of the main promoters of ICTs, especially among those levels of the food chain that have the potential to benefit the most (distributors, retailers, brokers, etc.), which in turn have a positive effect throughout other levels of the value chain.

The growth and penetration of mobile ICTs in rural areas (especially mobile phones), and innovations in electronic media to support education and training (e-learning), represent new opportunities to increase the development of human and social capital, among other aspects. Mobile ICTs can contribute to the strengthening of relations between stakeholders in the value chain; it is possible to promote the “culture” of the use of ICTs through ‘e-learning’, as well as the development of information skills of different stakeholders in chains.

The impact that ICTs have in improving competitiveness of food chains is very promising. Issues such as traceability, process control, transparency in market information, reducing transaction costs, and identification and tracking of consumer needs, are only a few examples that illustrate its importance.



This Policy Brief is based on the input of e-Agriculture Community members who participated in the online forum held from 26 July to 6 August, 2010.

The complete discussion can be found (in Spanish) in the Forum Archive at www.e-agriculture.org/forums/archives

Further information and resources can be found in the Key Topics section of www.e-agriculture.org