Enabling Community-Public-Private Partnerships in Information and Communications Management For Agricultural Research for Development

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ABSTRACT

Agricultural research for development, largely aimed at fulfilling agricultural technological needs of developing countries, has primarily been carried out by national public funded Institutions and international research systems funded by foreign donors such as that of the Consultative Group on International Agricultural Research (CGIAR). These institutions generate public goods. The use of new Information and Communication Technologies (ICTs), especially the Internet, Cellular telephony and FM radio, is bringing about the possibility of new partnerships in information generation and use between the agricultural community, the public and private sectors (C-P-P partnerships).

The generation of data and information in pluralistic extension systems now being advocated and promoted the world over inherently recognizes that farmers and agribusiness entrepreneurs are also generators of agricultural data and information and not only users. The corporate private sector in many developing countries provide not only the "bus" or channels through the Internet and Cellular Telephony needed to communicate but also the applications to make use of data and information. The public sector's role still remains to be generator and manager of organized agricultural data and information.

However these roles are fast changing. The current user communities and individuals, with farmer and civil society organizations in the lead, are organizing themselves through participatory efforts to generate data and information related to agriculture and natural resource use. This local data and information of natural resources such as soils and water, agricultural biodiversity, disease and pests etc and used through GIS systems is proving to be far more accurate, relevant and current than that acquired through conventional approaches such as surveys. The private sector has seen the potential of agricultural knowledge services and has initiated businesses that generate value added services such as for advising farmers through call centers, assessing risk for financial and insurance service providers, forecasts on markets in addition to being channel providers and generating applications. The public sector in developing countries, however, still finds it difficult to link up with the private sector and use the community sector to leverage its data and information management, especially in generating accurate local data, in disseminating information, new skills, knowledge and technology and in acting as a "Trust" organization in validating the relevance and accuracy of agricultural information.

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This paper discusses with examples, in the context of emerging information and communications technologies, the rapidly changing roles of the public, private and community sectors in information management for agricultural research for development, the constraints faced by each sector in working in partnerships as also how public-private-community partnership can rapidly enlarge further the effective management and use of agricultural information for development. It also discusses the Global Forum on Agricultural Research's efforts in advocating and building effective C-P-P partnerships.

Keywords:

Public private community partnerships, Information and communications technology, Agricultural research for development

1. INTRODUCTION

Agricultural research for development, largely aimed at fulfilling agricultural technological needs of developing countries, has primarily been carried out by national public funded Institutions and international research systems funded by foreign donors such as that of the Consultative Group on International Agricultural Research (CGIAR). These Institutions generate public goods. The use of new information and Communications Technologies (ICTs), especially the Internet, Cellular telephony and FM radio, is bringing about the possibility of new partnerships in information generation and use between the agricultural community, the public and private sectors (C-P-P partnerships).

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However these roles are fast changing. The current user communities and individuals, with farmer and civil society organizations in the lead, are organizing themselves through participatory efforts to generate data and information related to agriculture and natural resource use. This local data and information of natural resources such as soils and water, agricultural biodiversity, disease and pests etc and used through GIS systems is proving to be far more accurate, relevant and current than that acquired through conventional approaches such as surveys. The private sector has seen the potential of agricultural knowledge services and has initiated businesses that generate value added services such as for advising farmers through call centers, assessing risk for financial and insurance service providers, forecasts on markets in addition to being channel providers and generating applications. The public sector in developing

countries, however, still finds it difficult to link up with the private sector and use the community sector to leverage its data and information management, especially in generating accurate local data, in disseminating information, new skills, knowledge and technology and in acting as a "Trust" organization in validating the relevance and accuracy of agricultural information.

This paper discusses, using a framework and with examples gathered from reports and proceedings of Global Forum on Agricultural Research (GFAR) stakeholders such as Asia Pacific Association of Agricultural Research Institutions (APAARI,2010) and Association of Agricultural Research Institutions in North Africa and Near East (AARINENA, 2011) and other literature. It discusses, in the context of information and communications technologies, the rapidly changing roles of the public, private and community sectors in information management for agricultural research for development, the constraints faced by each sector in working in partnerships as also how public-private-community partnership can rapidly enlarge further the effective management and use of agricultural information for development. It also discusses the GFAR's stakeholders' and the Coherence in Information in Agricultural research for Development (CIARD) members' efforts in advocating and building effective C-P-P partnerships in this area.

2. COMMUNITY-PUBLIC-PRIVATE PARTNERSHIPS

2.1 Generic Framework of ICT Use in Agricultural Development

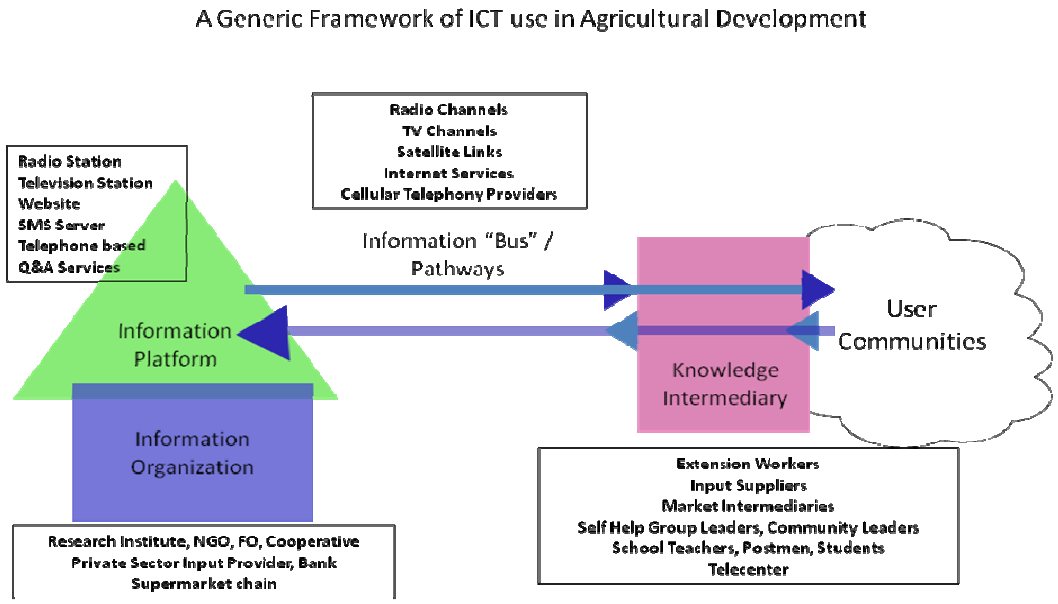

Figure 1: A generic Framework of ICT use in Agricultural Development

Figure 1 describes a generic framework of ICT use in agricultural development in developing countries.

Every agricultural information system for agricultural development has one or more "information organization" which provides the backbone for organizing and structuring information content. These are usually Research Institutes, Civil Society and Non Government (NGO) and Farmer Organizations (FO), Cooperatives, Private Sector Input Providers, Banks and other Financial Service Providers and, now, Supermarket chains.

Information Organizations disseminate and receive information through "Information Platforms" such as Radio and Television stations, Websites, SMS Servers, Telephone based Question and Answer Services etc.,. These can be owned by the community and civil society organizations such as community radio stations and websites, public such as research Institutes and private for profit organizations. In most developing countries, structured and organized information content (including data) is usually available only with agricultural research organizations. Most of these organizations, as detailed studies indicate, are weak not only in organizing their information for electronic dissemination but also have very weak information platforms that use new ICTs (APAARI, 2010, AARINENA, 2011).

The information content from and to these platforms travel through an "Information Bus". Radio and Television Channels, Satellite, Cable and Wireless Internet links and Cellular Telephony networks etc., form these information buses. A bus may be individually or collectively owned by the Government/Public Sector and/or the private sector. The information bus(es) such as radio and television are usually government owned. New ICT bus(es) such as for Internet and Cellular Telephony may have government/public sector and/or public sector ownership.

The information made available for agricultural development in most cases from information platforms in many developing countries is used through mediation by "information intermediaries" who adapt relevant information for local use making it useful. Information Intermediaries may be government employed extension workers, non-government organization or private sector input providers who double up as information providers. Sometimes Farmer organizations act as information intermediaries.

The user community is the actual user of agricultural information and is currently largely made up of farmers. As agriculture in developing countries shift towards being more market oriented, actors in the entire value addition chain of agricultural commodities who are largely small and medium entrepreneurs such as transporters, processors and marketers, also become users of agricultural information. However, the type of information used, and therefore needed, depends on where the entrepreneurs perform in the value addition chain.

As such, there is varying degree of community, public and private sector partnerships in ICT use for agricultural development. These partnerships not only play a role in value addition and marketing of agricultural inputs and products but in its innovation and increasing in "information chains" that support agriculture and farming as also the communities depending on agriculture and related occupations.

2.2 State of Community-Public-Private-Partnerships

The current state of Community-Public-Private (C-P-P) partnerships in information and communications management (ICM) and ICT use for agricultural development in developing countries can be considered to be nascent and at the moment very weak. Most studies available are in part and describe one service, usually cellular telephony, that provides market and market related information, mostly prices of agricultural commodities. There is a dearth of holistic description of information systems that support agriculture production, value addition, innovation and information chains.

2.2.1 Information Content

The conventional link of agricultural research, the main information content provider, and the private sector has largely been through printed publication of scientific and technical literature. Except for a few countries such in South Asia, even radio and television channels that communicate agriculture related information to farmers and other users had always been operated by the public sector and Government operators with weak links to agricultural research organizations. With the advent of community radio, the civil society and with cellular telephony and the Internet, the private sector has now entered as also communication channel providers. However, the public sector agricultural research organizations, the primary generators of organized data and information, now find it difficult to make relevant and useful information content available and accessible in digital format to the new private sector and civil society channels.

The generation and processing of primary information content by public sector agricultural research organizations is constrained by Capital, Content, Connectivity, Collaboration, Capacity, Community participation and Culture in these organizations (GFAR, 2011). Most research organizations in developing countries are constrained for financial resources to organize and structure information content that can be disseminated by ICTs, especially new ICTs such as those using Internet and Cellular Telephony. The costs to organize, structure and maintain the content, even when it is available, and to disseminate it through new platforms are significantly high and overwhelm the organizations financial resources as also human capacities. Research Organizations have developed organizational structures and work processes around research outputs such as technology packages and research papers.

The bottle neck in generating and providing appropriate content and in developing appropriate platforms for digital information that can be value added and disseminated by these new civil society and private sector channels is the main reason why many of the new ICT services have failed to be initiated and sustained without government and public sector support.

Transforming these agricultural research organizations to enable information content that can be disseminated and made useful for user communities will need significant funding support, capacities and change in Institutional arrangement and organizational culture. The change needed in organizational culture is towards recognizing that under the new paradigm of agricultural development which is knowledge intensive, there is a need for complex community-public-private partnerships to deliver relevant, timely and useful information to user communities and complete the research-innovation-development pathway.

2.2.2 Information Services

Traditionally, agricultural information in developing countries has been provided through public sector extension services. These services also operate radio and, in most cases, television broadcasts. However, in some countries such as India, private sector television services such as Eenadu TV (eTV) also broadcast farming related broadcasts. These services depend on an advertisement based business model. Community radio is also an emerging localized service providing agricultural information. These are usually operated by Community and Civil Society Organizations.

There have been efforts by the private sector to provide value added information services for agricultural development in several developing countries. The use of Internet and cellular telephony for providing market related information is well reported (David-Benz et. Al, 2011; FAO, 2012).

In India, cellular telephony services provider Airtel (Airtel, 2008) has initiated value added information services for agriculture. It has been reported that content used by Airtel, especially in its Question and Answer services, is through its own specialists, usually retired agricultural experts.

It is quite apparent that the private sector is not yet keen to invest in generating r supporting the generation of primary information content beyond market prices. The collaboration between specialist content providers such as public sector agricultural research organizations and Universities and private service providers apparently can be “win-win” solution. A new arrangement is now needed between the public and private sectors, much beyond the existing in which the private sector played a role in publishing scientific papers. The shape of this new arrangement, where the economics of information management in developing markets will play a key role, is yet unknown and needs to be developed and tested.

There is very little available information on software and applications related to agricultural information services, beyond those for market information, for farmers in developing countries developed either individual, small and medium enterprises or the corporate private sector. Most of the software and applications available are developed as pilot research projects in public sector Institutions. These have a significant problem of sustainability because of it being funded as short term projects. Apparently

opening access to agricultural information and applications by the public sector Institutions can contribute to the entry for the private sector for developing software and application that use data and information both from the public sector and those provided by the community. The Indian Council of Agricultural Research is planning the development of a "Business Incubator Centre" for information and knowledge services (Personal communication, 2013)

The availability of "information buses" and their ownership also play a key role in agricultural development. In most developing countries a large number of the clientele for agricultural information are resource poor smallholder farmers. While the potential of new knowledge as a critical input to leverage the efficiency of all other inputs, contribute to risk aversion in farming and improve the marketing of farm outputs, is now recognized, governments still directly or indirectly limit access to information from new channels such as cellular telephony. This is either in the form of costs to access mobile services, poor coverage in rural areas due to sparse number of users or not upgrading to new generation technologies such as 3G and WiMAX which would offer data linkages and therefore voice and video based services that would enable overcome the barriers of literacy and remoteness. One very key need by the agricultural community and all sectors is to advocate the use of Universal Access funds as per various International Telecommunications Union Treaties in rural areas of developing countries to improve agricultural development through improved access to information using new ICTs.

2.2.3 New Community-Public-Private Partnerships

Local agricultural data and information, especially real time information, can improve farm productivity and quality of outputs enabling access to inputs that are in short supply such as seed, energy (diesel, petrol, electricity), harvesting and post harvest on-farm processing and transport to markets. Local data and information can most effectively and efficiently be collected by community participation and enabling automatic data capture systems.

The availability of mobile phone based financial transaction systems such as in East Africa and Automatic Teller Machines in rural villages in India bring qualitative changes in the social structures of communities and demonstrate how networked data and information flows in local rural communities is possible. It is here in local communities that a new type of information and knowledge service providers and intermediaries based on Community-Public-Private Sector partnerships are emerging. These usually are managed by small, local entrepreneurs who provide the connectivity and value added information services.

At the farm level, especially when farm size is small, new tools and techniques to spatial mapping can contribute to bringing precision agriculture to these holdings. A new area of research emerges when "big data" analyses is applied to geo-referenced farms and farm plots improving not only resource use but also monitor and forecast pests, diseases and production problems. Farm level data when aggregated and used collaboratively by agricultural

communities can bring efficiencies in farm management, input, throughput and output, labor use and in marketing and transport.

Agricultural knowledge services is now a sunrise entrepreneurial opportunity for the private sector in developing countries. The clientele for these services are now not only the farmers but also a wide range of other service, input providers, processors, producers and market intermediaries. Banks, Insurance and other financial service providers need a wide range of data and information to value assets and production potential and productivity. As markets open up and become organized, commodity exchanges also require significant data and information. Input providers such as for seed, fertilizer and pesticide are conventional users of agricultural information and are benefitted from more accurate and detailed information but new input providers such as those leasing and renting farm machinery and providing transport also benefit.

The use of new ICTs has potential to provide new occupations and improve farm based livelihood provided new arrangements in providing value added locally relevant, useful, timely information through C-P-P partnerships are made. Each of the sector, the community in generating and providing local data and information, the public sector in providing the necessary research, innovation and trust services in developing primary information, applications and organizing information services and the private sector, both corporate and the small and medium entrepreneur providing connectivity and value added services has a role to play in this new partnership based arrangement.

2.3 The Global Forum on Agricultural Research (GFAR) and Coherence in Information in Agricultural research for Development (CIARD) Movement

The Global Forum on Agricultural Research (GFAR: http://www.egfar.org) is a multi-stakeholder platform comprising of the public sector research and development organizations of the South, private sector, civil society and farmer organizations, advanced research organizations of the North, Universities etc. for dialogue on critical issues related to agricultural research and innovation for development. It also advocates, promotes and facilitates collaboration and partnerships among relevant actors and stakeholders on critical actions related to agricultural research and innovation for development.
GFAR advocates increased and improved investment in agricultural information and communications management (ICM), supports and facilitates capacity and skills development for ICM, contributes to greater coherence and integration of agricultural information globally and enables improved flows and use of agricultural research information through its programs.

GFAR has initiated a major activity in advocating, promoting and facilitating opening of access to agricultural information in national agricultural research and innovation systems as a partner to the Coherence in Information in Agricultural Research for Development (CIARD: http://www.ciard.net) movement. Over the past 5 years, the CIARD movement has developed

guidelines, pathways and the CIARD.RING (http://www.ciard.net/ring) to improve ICM and enable opening of data and information from agricultural research organizations globally.

3. CONCLUSION

C-P-P collaboration and partnerships with each sector contributing and playing its role have huge potential for information and communications management in agricultural research for development. The community can generate locally relevant and accurate data and provide feedback on the quality of information, the public sector can provide the much needed informatics related research for developing data and information bases, modeling and simulation, knowledge based systems and geographical information systems, be data and information generators, act as "trust" organizations and provide open access platforms for agricultural data and information. The private sector has a significant role not only as new communication channel providers but for providing value added information services, software and applications for more widespread information management and effective use by farmers and other users. Experience so far indicates that the C-P-P partnerships are yet nascent but emerging. They need to be accelerated through appropriate policies and facilitating structures.

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