

Using recent advances in technology-modulated distance learning approaches to reach the rural smallholder producer

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Introduction

The questions now are:

- ✓ What are the recent advances in distance learning technologies?
- ✓ How should they be employed?
- ✓ What are the merits and constraints in their use?
- ✓ How can their use be optimized to achieve the goals of the distance education that it seeks to support?
- ✓ This paper, therefore, attempts to address these issues.

TYOLOGY OF MEDIA TECHNOLOGIES IN DISTANCE LEARNING FOR RURAL FARMERS

Traditional technologies:

- Print Media
- Radio and
- Television technologies.

Recent ICTs

- Computer/internet technologies
- Wireless telephony

RADIO EVOLUTION: A RECENT ICT AND RURAL FARMER INTERFACE/INTERMEDIARY

- ◆ The focus of this paper is on recent technologies in distance learning.
- ◆ But radio is a continuously evolving traditional ICT, because we can now talk about digital satellite and FM radios.
- ◆ In one way, radio serves as a 'soft landing' introduction of the digital technology to rural Africa since the partner rural community stations would be using digital satellite to receive radio signals.
- ◆ Before the independence of most African countries there were national urban radio programmes aimed at giving the populations advice on hygiene and health or practical economy, especially farmers.

- ◆ Soon after, the African State governments became aware that most radio programmes were suited to the taste and needs of city dwellers.
- ◆ It became necessary to review the programmes for the rural people, and hence, the concept of *rural radio* emerged.
- ◆ The rural concept signified a two-way process, which entailed the exchange of views from various sources and the adaptation of media for use by the communities.
- ◆ Community participation was therefore a fundamental characteristic of rural radio - live public shows, village debates and participation in the actual management of the radio station
- ◆ Rural radios which started blooming in the 1970s ended up gradually being confined to a type of bureaucratic production due to lack of necessary means to go where the peasants live i.e. in rural areas.
- ◆ The concept of *Local Rural Radio or Community Radio* as it is now popularly called, an innovation capable of laying the foundations for a possible renewal of communication in Africa oriented towards a participatory teaching method related to development was born

Strength and Weaknesses of Radio

Strengths

- i. Radio, an ICT that is designed for communication in the oral mode. For this point of view, it is particularly appropriate in a region of the world where illiteracy rates are very high.
- ii. Radio is relatively cheap, both to broadcast and to receive.
- iii. Modern radio receivers can run on little battery power for long periods of time, thereby making them well suited to communication among rural dwellers with little or no access to electricity.
- iv. Radio is mobile and can accompany listeners as they move from one place to another Important in nomadic cultures, movement of refugees etc).
- v. Considering the high level of linguistic diversity in Africa, radio is an information technology that can be used to promote and sustain this diversity through programming that targets specific language communities

Weaknesses

- ◆ Radio cannot transmit all kinds of messages.
- ◆ Listeners often lack concentration.
- ◆ Complex information or long periods of unbroken speech often lead listeners to tune out.
- ◆ Information is not permanent.
- ◆ Radio is usually used for one-way communication flows. Possibilities for feedback and dialogue are limited.

Some Examples of Rural Radio-based Initiatives.

- **CTA's Rural Radio Resource Packs (RRRPs):** CTA launched its rural radio support programme in 1990, to strengthen ties between researchers, extension agents, farmers and managers of information and communication services, and to improve the dissemination of information for the benefit of farmers by improved adoption of new technologies.
<http://www.agricta.org/icdd/radio.htm22.9>,
- **Developing Countries Farm Radio Network (DCFRN):** DCFRN, a Canadian NGO. One of its longstanding activities is the production of radio scripts, which are distributed to partners for use in radio broadcasts, extension services, classrooms and even community theatre. Approximately 500 scripts have been produced on topics such as crop production; post-harvest techniques; nutrition; tree planting and farm forestry; natural resource management, and women and youth in agriculture. Their website can be found at <http://www.farmradio.org>
- **The International Service for National Research (ISNAR):** Using rural radio to link agricultural research with rural communities. The project aims to link agricultural researchers with radio broadcasters in an effort to strengthen the international capacity of both groups to collaborate, identify needs, and address these needs through training and subsequently, the application of new or improved knowledge, attitudes and skills. More information can be found at <http://www.isnar.cgiar.org/activities/radio.htm9>.

Community Radio Initiatives in Africa

- **Radio HomaBay:** Early in May 1982 the community radio station of HomaBay in the province of Nyanza in Kenya started broadcasting regularly in the local language, Luo. Most programmes were made from interviews in the market places, farms, schools and organized groups
- **Radio Penc Mi - Senegal First Community Radio:** Radio Penc Mi was created in June 1996, by three farmer associations: Jig Jam, Union des groupements de Koulouck and Maison familiale Rurale de Kaïré, assisted by the UK based NGO Oxfam. It works closely with the Agricultural Research Centre of Bambey (ISRA),
- **Jokkoo FM, Rufisque, Senegal** similarly, was created in 2003, under the sponsorship of UNESCO's International Programme for the Development of Communication (IPDC) with similar objectives.
- **Radio Salus, Rwanda:** Salus Radio which was started with support from the European Union and UNESCO broadcasts in Kinyarwanda, Kiswahili, English and French on FM 97.0. It provides educative, informative and entertaining programmes, while some of the aired shows focus on health, economy (business and poverty reduction), culture, religion, HIV/Aids and Education.
- **Kagadi-kibaale Community Radio (KKCR), Uganda;** The first community radio station was established on 20 July 1999 broadcasts in prevalent local languages. This station is distinctly different from public or commercial radios that are rural-based in that it is fully owned by the local villagers in the sub-county of Kagadi, in Kibaale District, Western Uganda. The villagers have selected a committee to represent the different interests and stake holders groups in the management of the station

Radio Broadcasting Strategy: The Special Interest Groups (SIGs)

- ❑ After a decade of existence, the limits of collective listening structures as the basis of rural radios in Africa were quickly evident. The failures of the Association of radio clubs in Niger (ARCN), of Radio Clubs in Benin and Burkina Faso are examples.
- ❑ So unlike the 1960s when it was reasonable to expect people to make a 5-6 mile journey on foot to join a radio forum listening group, it is no longer fashionable to expect them to walk such distances.
- ❑ Successful listening groups have been recently based on special interest groups (SIGs) rather than on the earlier groups which were mainly social in nature.
- ❑ Co-operatives, fishermen/farmers association, religious teaching groups and women's groups are just some of the organisation that frequently exist in rural areas.
- ❑ This is because it has been proved beyond reasonable doubt that, programmes creatively tailored to the needs of groups are most likely to be listened to with special interest by those groups.

Examples of Successful SIGs Strategy

Uganda National Farmers' Association (UNFA)

It is an umbrella organisation for farmers in Uganda. It has branches in various districts of the country.

It gives an opportunity to farmers to come together and address their problems collectively.

UNFA identified radio as an appropriate media to educate farmers, enable farmers share experiences, enable farmers get information from technical people and provide information on market prices for farm produce.

It began by running programmes on Radio Uganda in six major languages. However later it was realised that the farmers needed to be involved as much as possible in the final output to them.

So it changed approach and has now established radio listenership groups (RLGS) which are formed within the already existing structure of special interest groups (SIGS).

These SIGS are groups of farmers that come together because of a common interest.

The programmes are made by professional broadcasters and distributed to the SIGS on demand.

This approach has proved more effective and participatory and the farmer gets exactly what he/she requires.

More Recent ICTs used in Distance Learning of Rural Agriculture

- African countries cannot afford to ignore the new ICTs - wireless telephony and internet without lagging behind and being excluded in the global economy and events
- The effects of these ICTs on our world have been far reaching, changing the way we do business, learn, *practice agriculture*, and even how we use leisure hours of our day.
- Africa has the lowest levels of Internet penetration, despite the existence of the SAT 3 fibre optic cable along the west coast of the continent that provides connections to the Internet backbone infrastructure.
- In Africa there are just 111 users per 10,000 people, compared with 585 in Asia, 2444 in the Americas and 3333 in Europe.
- Similarly, Africa has only three Internet hosts per 10,000 inhabitants, in contrast with 37 in Asia, 955 in Oceania, 1440 in the Americas and 229 in Europe.^{3 3}.
- This limited penetration can be attributed to unreliable connections, and the high cost of using the telecommunication infrastructure. 12

- ❑ ICTs should facilitate business development through improved access to information on product prices (inputs and outputs), on markets, and on various other resources.
- ❑ Therefore, in agriculture, African farmers expect ICTs to facilitate access to: high-yielding varieties at competitive prices; input suppliers; credit institutions; and information on how to improve their farming practices to increase yield.
- ❑ For example, farmers in the Ross Béthio region of Senegal expect ICTs to provide access to new knowledge on irrigation techniques and rice varieties for irrigated farming because they would like to shift to cash crops, which earn better economic returns.
- ❑ However, disparities of access, language barriers, low literacy levels, the cost of the technologies and of connectivity are creating a growing digital divide which hampers vital access to new knowledge resources for many in Africa

Access to ICT Infrastructure in Rural Africa

- There are many solutions to rural Africa's access problems on the horizon: including direct satellite connectivity and other wireless technologies.
- At present, however, most of these technologies are either still too expensive or have limited bandwidth, which makes access to internet difficult.
- In addition to physical connectivity, therefore, many other challenges that need to be addressed, such as developing the capacity of resource persons who act as intermediaries and agricultural producers to enable them to use ICTs effectively as part of their production, marketing and distribution activities.
- Others include the provision of relevant content in local languages and useful applications. From their perspective, providing infrastructure and increasing access to ICTs may seem the most logical primary goals.
- Developing content and investing in human capacity may appear secondary, less important priorities, yet they are crucial to ensure that ICTs are effective in supporting development, and should be integral to all rural development and poverty reduction strategies

Rural Mobile Telephony

- ◆ The appearance of new wireless ICT applications for two-way access to the internet via satellite presents a very real opportunity to overcome existing poor connectivity in Africa in the long run.
- ◆ An example such technology is Cellular/Global System for Mobile Telecommunication (GSM).
- ◆ Mobile telephones have multiplied considerably in the recent years and are filling the gap in nation telephone networks.
- ◆ They are easy to use and greatly facilitate direct communication between individuals and possibly institutions
- ◆ In Africa, where one might have thought that the technology would be least advanced because of the poverty of many countries, there is a new breed of telecommunication companies who are investing for profitable purposes, and also not specifically to improve the levels of market information in rural areas.
- ◆ There are also problems with the socio-economic heterogeneity of the rural areas and differential access to the technology. But the technology is in place in many areas, and is spreading rapidly.

- Market research has shown that Africa is still the fastest growing region in the world in terms of mobile phone subscribers
- Africa's huge growth rate is mainly due to the rapid growth in South Africa, Nigeria and Northern African countries such as Tunisia and Algeria, showing that access to mobile phone technology is unevenly distributed throughout the region.
- Penetration rates in Africa may be misleading as it has been shown that in Africa the impact of mobile phones extends beyond what the number of subscriptions suggests.
- There is a culture of sharing communication tools that means that whilst a mobile phone may belong to a single person, it is often shared between members of a local community. In India, this cultural aspect is also present.
- In Senegal, Manobi launched a free-access SMS market information service that sends free SMS containing relevant information to fisherman, traders and local authorities.

Radio and Recent ICTs in Market Information Services (MIS)

- To strengthen the competitiveness of farmers, market information services are being developed that take advantage of ICT technologies such as radio, mobile phones and internet based communications systems to enable farmers to monitor and adjust to dynamic market conditions.
- In Uganda, up to 94% of farmers owned a radio and 25% owned mobile phones. Radio was the preferred source of market information with approximately 68% of farmers regularly accessing market information through market news radio programs

Market Information Services (MIS) Initiatives

PROMIC in Benin: The Micro-Finance and Marketing Project (PROMIC) is jointly financed by the International Fund for Agricultural Development (IFAD) and the Government of Benin. In terms of broadcasting, information is generally broadcast on the day preceding, as well as on the market day of the locality in which the rural radio station is installed. The broadcasts are made in the national languages of the locality in which the radio station is situated. In addition, the prices broadcast are given in local measures.

The Ugandan MIS: IITA (International Institute for Tropical Agriculture) collaborated with CTA and USAID in setting up a new MIS at national level to collect the market prices of 28 products in 19 districts every week, and disseminate it via national radio. The initiative was particularly important in a country such as Uganda where a large number of languages are spoken in the country and market information broadcast at national level is often in a language that the population does not understand

Market Information Service in Ghana: The small-scale MIS was started in 1999 based on a single assembly market in Ghana. Currently, MI are disseminated weekly through 3 FM stations and billboards in 3 local languages. There are now 9 project data collection centres. The main beneficiaries are the small-scale farmers. Financed by CTA

Kenya Agricultural Commodity Exchange (KACE) Pilot MIS; A pilot MIS was initiated in 2002 by KACE in collaboration with CTA, providing market information on two of Kenya's staple food crops – maize and garden beans. Clients, especially smallholder farmers, go to the Market Information Centres (MICs) to receive as well as provide market information.

Mobile Telephony and Market Information Services (MIS)

- **The Manobi Example:** Manobi is an operator of value added services on GSM whose headquarters are in Montpellier, France. In 2003 it was established with the Sonatel Group, a Senegalese subsidiary which operates mobile data channels and provides professional services on GSM. It has just opened a new subsidiary in South Africa.
- Manobi's innovative internet and wireless e-services use WAP (Wireless Application Protocol) and SMS (Short Messaging Service) technology via cell phones to provide Senegalese fishermen with up-to-date weather reports and market price information. In addition the fishermen are able to use the interactive technology to input fish stock information for marketing purposes, and to log their departures and estimated times of return, so that local fishing unions can be alerted if fishing boats fail to return on time.
- **Kenya Agricultural Commodity Exchange (KACE):** KACE has developed an SMS market information service branded as SMS Sokoni in partnership with the Safaricom Limited, a leading mobile phone service provider in Kenya.
- A farmer anywhere in the country where the Safaricom network exists can in easy steps access market information like commodity prices in different markets, who is buying or selling what commodity, at what prices, where and when, as well as access extension messages using their mobile phones.
- The user receives and pays for the SMS messages to the service provider. SMS is easy to use, reliable, convenient and low-cost. The information is updated everyday and hence is most current and timely to the user

The Community Multimedia Centre (e-Agricultural Centre) Model

- Community radio and modern ICTs are clearly complementary and can function in parallel in the same community, offering a broad spectrum of distinct services.
- The individual user model of access to ICTs in Western consumer societies is clearly inadequate for poor communities in Africa.
- Their integration with radio enables this relatively high investment to reap maximum returns by reaching the entire community.
- The *Community Multimedia Centre* would offer ordinary people a gateway to the global knowledge society.
- It combines local radio (or television) by local people in local languages with ICT applications in a wide range of social, economic and cultural areas.

- At its most basic, the centre would offer the simplest portable radio station, plus a single computer for Internet browsing, e-mail and basic office, library and learning applications.
- In villages without electricity or telephones, where Internet cannot be accessed directly, solar energy and satellite technology can be used.
- For sustainability, a community multimedia centre may offer a combination of public and privately run facilities, with services such as telephone, fax and e-mail possibly offered on a commercial basis alongside not-for-profit access to other facilities.
- The creation of the infrastructure is only a first step. The key to the success of these centres is their ability to collect, interpret, produce, exchange and disseminate relevant contents for the development needs of individuals, target groups such as women and young people and for the community as a whole.

Successful Rural e-Centre Initiatives in Africa

Banque de Programmes On-Line (BDP On-line):

- An extension of Panos West Africa's Banque de Programmes,
- Distributes tapes of documentaries from W&C Africa to one hundred stations
- BDP On-line exchanges programs between African stations *via the Internet*.

Oke-Ogun Community Digital Information Centres (CDICs):

- This account of Oke-Ogun Community Development Network in rural Nigeria
- Demonstrates how ICTs do not just "come", but are introduced
- Reveals infrastructural and cultural barriers to ICT and digital information
- Using [Solo computer](#), and its potential for rural Africa.
- The Solo is an ultra low power computer - about the size of an A4 ring binder.
- Designed to be used away from sources of mains electricity
- Serving the needs of special interest groups (SIGs) in the community.
- The primary SIGs are health, education, women, agriculture, and youth.

Successful Stories outside the Africa

Kotmale Internet Project, Sri Lanka:

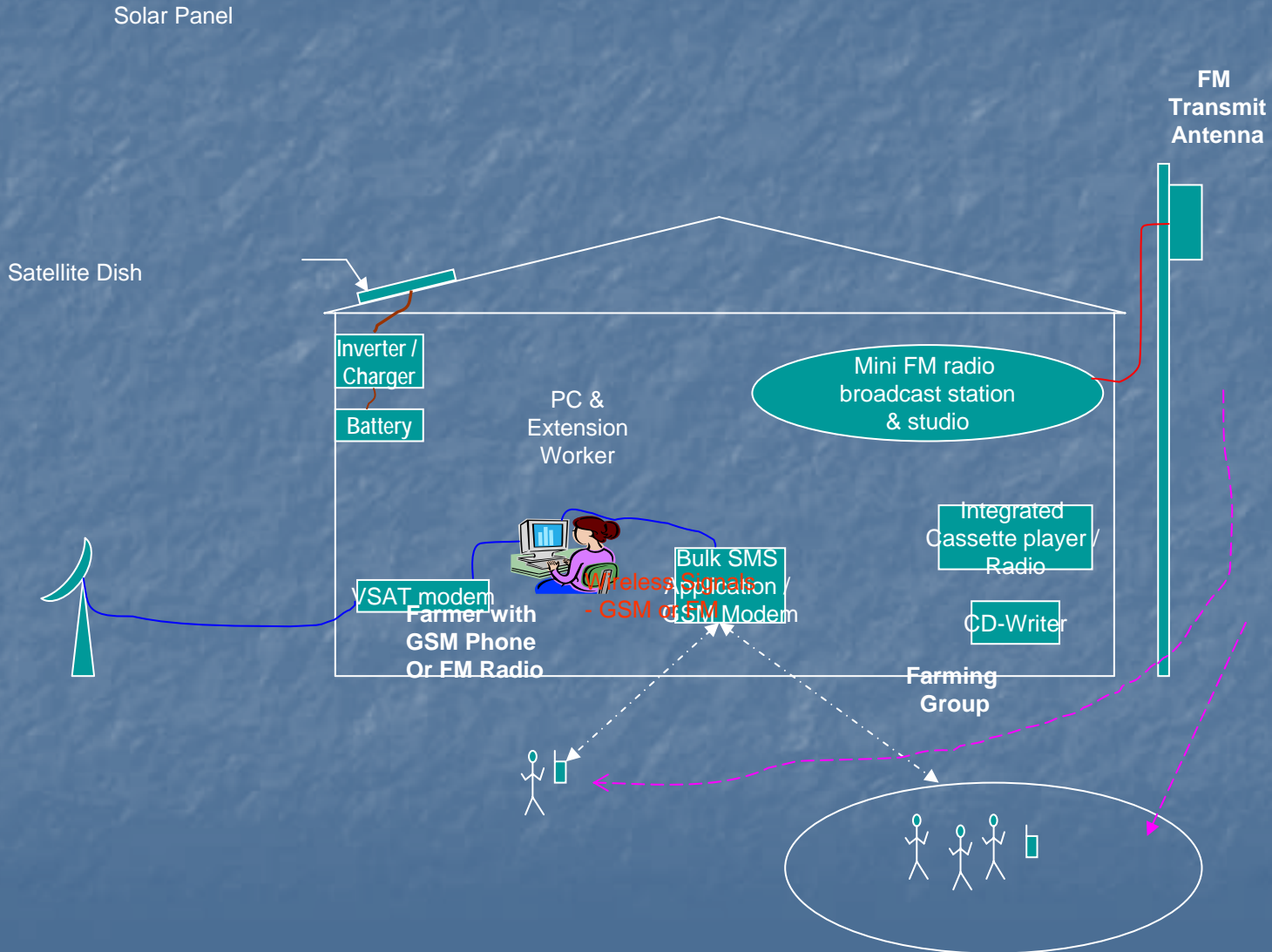
- ❑ The UNESCO-supported Kotmale Internet Project in Sri Lanka
- ❑ One of the best-known examples of a radio station adopting the role of a gateway or community intermediary between its listeners and the Internet.
- ❑ The Internet Project has two main components: a community telecentre, and Radio Browsing,
- ❑ a daily two-hour radio program in which journalists take the Internet to the community by surfing the web in search of answers to listener queries.
- ❑ Radio Browsing finds information that is useful to the communities and then interprets it - making useful information meaningful. It plays a role that is part search-engine, part librarian, part journalist and part translator.
- ❑ English is the language of the Internet, but not of most Sri Lankans.

Radio Yungas, Bolivia:

- ❑ Yungas, a rural station in Bolivia
- ❑ Another example of a Radio station playing a gateway role.
- ❑ The station has a daily program in which listeners send in their questions.
- ❑ The answers used to come from the 15 year-old encyclopaedia in the town library, but now they come from the Internet.
- ❑ When a local farmer sent in a description of an unknown worm that was eating his crops,
- ❑ Yungas sent the message out to a specialised electronic list.
- ❑ Six hours later they had an answer from a Swede, a leading worm expert, in which he identified the worm and explained how to deal with it.
- ❑ The answer was broadcast to the entire community, and we can be sure that the farmer with the question was not the only one with the worm problem

The Community Multimedia Centre Model

Community e-Agricultural Centre



Components of the Proposed e-Agricultural Centre

Physical Infrastructural facilities and Labour:

Physical space would be provided by community.

It could be community hall or a rented building.

About 2-3 persons/volunteers would be trained in basic computer operations and broadcasting

Act as interface/intermediaries between the ICT facilities and the rural community end-users,

Technology Infrastructure:

Satellite technologies would be utilized instead of the SAT3 backbone/fibre optic cabling,

Economies of most African countries cannot support this connectivity, and hence the choice of satellite technology.

- **A Local FM radio station** should be preferentially installed because of its local nature, high fidelity, cost-effectiveness and low power demand.
- In countries where airwaves are not yet liberalized, satellite radio facilities should be employed.
- In terms of hardwares, 2-3 computers should be provided, 1 printer, 1 UPS, 2-3 mobile telephones, 2-3 radio sets, VSAT and satellite modem, CD-ROMS with multimedia capability, VCDs, solar panels since most rural areas in Africa are not connected to electricity, GSM modem for sending SMS market information etc.

Ownership and Sustainability

- A diversified ownership for sustainability is recommended
- Local farmers' organizations (the ultimate users)
- National governments
- Local Government Councils should be involved in the financing of the centres,
- Development partners
- For further viability and sustainability some of the services should also be commercialized.

General Constraints and Opportunities of Using Recent ICTs in the rural Africa

Major Constraints

- The cost of infrastructure needed for ICTs (radio, computer, connectivity) is prohibitive
- The lack of telephone lines and high-power cables (including electricity) limit internet use to a few villages, and does not allow for acceptable transmission times.
- The internet relies on the use of international languages.
- Translating messages into various languages is not an easy task.
- One needs to have people who are well versed in the language.
- The scientific jargon is sometimes very difficult to interpret into native languages.
- Sustainability problem, most of the rural radio and internet initiatives are donor funded.

Opportunities

- In villages without electricity or telephones, where Internet cannot be accessed directly, solar energy and satellite, and wireless technologies can enable the delivery of multimedia information and distance learning materials and offer low-cost asynchronous data exchange via e-mail.

Conclusion/General Recommendations

1. Though the dual-mode model looks appealing for distance learning of agricultural skills, given its practical nature, but the realization would not be easy given the rural nature of the audience, hence the recommendation of the single-mode model.
2. The Community Multimedia Centre model based on the fact that ICTs will be oriented towards collective community use, while also being available for individual access, should be employed as an approach to e-agriculture by the rural African farmer.
3. In villages without electricity or telephones, where Internet cannot be accessed directly, solar energy and satellite technology that can delivery of multimedia information and distance learning materials and can offer low-cost asynchronous data exchange via e-mail should be employed.
4. Pilot e-centre should be established in the various African sub-regions to develop appropriate and feasible model which would be out-scaled to various countries and rural communities.

Conclusion/General Recommendations

5. The use of participatory and interactive community radio should be continued as a gateway for the rural people to the recent ICTs.
6. MIS as a means of producing transparent and competitive market should be encouraged and its dissemination using wireless telephony, community radio and the internet technologies be pursued.
7. Capacity building of the farmers and other end-users of the agricultural information and infrastructure must be enhance.
8. The formation of farmers' cooperation and SIGs as a basis for effective distance learning must vigorously encouraged.

THANK YOU FOR

THE WONDERFUL

ATTENTION