

Rural Radio and New Information and Communication Technologies (ICTs):
Implications on Agricultural Technology Dissemination and Adoption in Kenya.

EMMANUEL O. MOKORO, BSc.

A THESIS SUBMITTED IN THE PARTIAL FULFILLMENT FOR THE AWARD OF
MASTER OF ARTS DEGREE IN COMMUNICATION STUDIES OF THE
UNIVERSITY OF NAIROBI.

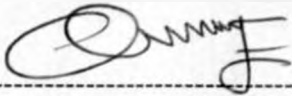
UNIVERSITY OF NAIROBI

SCHOOL OF JOURNALISM

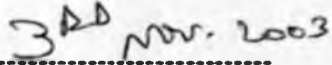
2003

Declaration

I hereby declare that this thesis is my original work and that no similar work or replica has been submitted to any institution for the award of a degree.

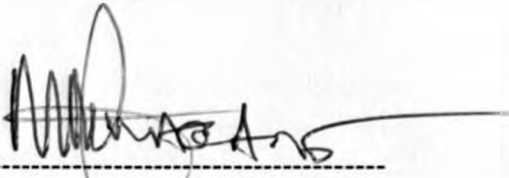


Mokoro Emmanuel Onyinkwa

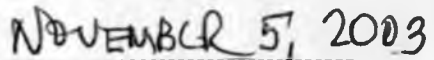


Date

This thesis has been submitted with my approval as the University supervisor.



Magayu Magayu



Date

Dedication

For all those who mean a lot to me: I am the
wind above, which you fly.

TABLE OF CONTENTS

<u>ITEM</u>	<u>PAGE</u>
Declaration	i
Dedication	ii
Table of Contents	iii-v
List of Figures	v
List of Tables	v
List of Abbreviations	v
Acknowledgements	vi
Abstract	vii-viii
 CHAPTER I	
1.0 Introduction	1 - 3
1.1 Problem Statement and Analysis	3 - 3
1.2 Objectives	4 - 4
1.2.1 Overall Objective	4 - 4
1.2.2 Specific Objectives	4 - 5
1.3 Justification	5 - 5
1.4 Target Beneficiaries	6 - 6
 CHAPTER II	
2.0 Theoretical Frame of Reference	7 - 8
2.1 Theoretical Descriptions	8 - 8
2.1.1 The Diffusion Theory	8 - 10
2.1.2 The two-step Flow Model	10 - 11
2.1.3 The Spiral of Silence	11- 13
2.1.4 The Knowledge-Gap Theory	13 -14
2.1.5 The Uses and Gratification Theory	14-15
2.1.6 The Social Learning Theory	16-17
2.2 Literature Review	17-25
2.2.1 Basic Principles of CBR	25-28
2.2.2 What ICTs Offer	28-30
2.2.3 ICT Challenges	30-33
2.2.4 ICT Appropriation	33-35
2.3 Operational Definition of Terms	35-38
 CHAPTER III	
3.0 Research Methodology	39-40
3.1 Scope of the Study	40-40
3.2 Research Area	40-41
3.3 Research Period	41-41
3.4 Sampling and Sample Unit	41-41
3.5 Project Strategies	42-42
3.6 Research Schedule	43-43
3.7 Assumptions	43-43
3.8 Limitations	43-43
3.9 Monitoring and Evaluation	44-44

CHAPTER IV

4.1 Findings	45-45
4.2 Demography and Resources	46-56
4.3 Case Studies	56-67
4.3.1 Kenya	56-57
4.3.2 Niger	58-58
4.3.3 Uganda	58-60
4.3.4 South Africa	60-61
4.3.5 India	61-62
4.3.6 Peru	62-63
4.3.7 Senegal	63-64
4.3.8 Bangladesh	64-65
4.3.9 West & Central Africa	65-65
4.3.10 Sri Lanka	65-66
4.3.11 Ethiopia	66-67
4.4 Findings in Perspective	67-67
4.4.1 Professional Ignorance	67-68
4.4.2 Professional Backstopping	68-69
4.4.3 Gender Discrimination	69-71
4.4.4 The Dependence Fix	71-71

CHAPTER V

Discussions and Recommendations

5.1 Policy and Structural Flexibility	72-74
5.2 Linguistic Simplicity	74-76
5.3 Technical, Political and Economic Empowerment	76-80
5.4 Development of Incentive Systems	80-81
5.5 Behavior Change Communication	81-83
5.6 Taking Comedy to the Farm	83-83
5.7 Riding on Folk Media	84-85
5.8 Building Linkages	85-88
5.9 Paradigm Shift	89-90
5.10 Source and Channel Credibility	90-91
5.11 Beyond Participation	91-92

CHAPTER VI

Conclusion and Way Forward	96-99
----------------------------	-------

APPENDICES

I Research Resources and Budget	100-100
II Farmer Sample Questionnaire	101-102
III Professional sample Questionnaire	103-106
IV Check List	107-107
V Bibliography	108-110
VI Profile of Implementer	111-111

LIST OF FIGURES

Figure 1: Radio and its Power	22
Figure 2: Characteristics of ASALs	45
Figure 3: PRA Process in Progress	51
Figure 4: Interviewing Radio Audiences	69
Figure 5: Rural Communication Linkages	86

LIST OF TABLES

Table 1: Income Levels in Kathonzweni, Rural Kenya	46
Table 2: Ownership of Power and Reception Gadgets	47
Table 3: Education Levels in Kathonzweni	47
Table 4: Infrastructure Development in Kathonzweni	48
Table 5: Extension Outlets	49
Table 6: Radio Attendance	50
Table 7: Farmer Involvement in the Planning Process	50
Table 8: Media Access and Effectiveness	52
Table 9: Development Agencies Operating in Kathonzweni	55

LIST OF ABBREVIATIONS

ACCE	- African Council for Communication Education
ASALs	- Arid and Semi-Arid Lands
BSc.	- Bachelor of Science
CBR	- Community-Based Radio
FAO	- Food and Agriculture Organization of the United Nations.
G8	- Group of 8 Industrialized Nations
ICRAF	- International Center for Research in Agro forestry
ICT	- Information and Communication Technology
IT	- Information Technology
KBC	- Kenya Broadcasting Corporation
M&E	- Monitoring and Evaluation
M.A.	- Master of Arts
PRA	- Participatory Rural Appraisal
PRCA	- Participatory Rural Communication Appraisal
R&D	- Research and Development
SEC	- Strategic Extension Campaign
SES	- Socio-economic Status
SIDA	- Swedish International Development Agency
TV	-Television
UNDP	- United Nations Development Program
UNESCO	- United Nations Educational, Scientific, and Cultural Organization
UNFPA	- United Nations Fund for Population Agency
URTNA	- Union of Radio and Television Networks of Africa

Acknowledgements

I would wish to thank the Training Division of the Ministry of Agriculture and the Directorate of Personnel Management in the Office of the President, for granting me a study leave that enabled me to undertake the studies that have culminated in this work. The School of Journalism of the University of Nairobi has been an eye opener to hitherto subtle opportunities. Special regards go to the Director, Wambui Kiai for her consistent ability to listen to everybody's problems and enquiries. My project supervisor, Magayu Magayu is a wonderful intellectual with a keen editing eye. He deserves many praises, in the absence of medals. All other dons who contributed to academic development deserve a salute.

It will be remiss on my obligation if I don't thank all other friends and relatives who assisted me in many ways during good and bad times. Fellow students at the School of Journalism were a useful lot in my personal, academic, and professional growth.

Various friends assisted in sharpening my inquisitive and investigative instincts. In this category are people like John Tonukari, Julius Nyangaga, Liston Njoroge, David Menge, Evans Maiko, Bernard Korir, and lastly, my brothers, Victor, Daniel and Reverend Alfred, for their tireless prayers and inspiration. Hundreds of authors who penned their works to satiate my appetite for more and unlimited knowledge.

Lastly, for my parents for giving attention to, and being tolerant and patient during my conception, birth and development.

Abstract

This research paper is a culmination of an attempt to address the glaring weaknesses in the provision of extension services with the support of rural radio and enhanced by the new ICTs. The basis of the study and the outcome can be extended to other media. Society is changing fast and there is need for a corresponding change in the method and process of doing things.

Chapter one deals with the introduction and problem conceptualization, study objectives, and justification for the study. Chapter two handles the theoretical framework and literature review, as a basis for the study of rural radio and new ICTs. Chapter three handles the methodology aspects of library research, field data collection and observation. Chapter four presents the findings from both the field research and library sources, and gives a qualitative analysis. Chapter five discusses the findings in light of the findings and proposes framework ideals and expected ICT development levels in Kenya that can result in improved technological advancement. Chapter six gives concluding remarks and tries to globalize the concept of ICT as local development levels are given a comparative projection.

The paper concludes that technology transfer is a complex process that requires that change agents invest time to find out the social, cultural, economic and political characteristics of people before venturing to implement interventions.

Choice of media, content, context, scope and personnel needs to be done meticulously to avoid disrupting the delicate social balance that exists in societies under development transition.

Rural areas need to be adequately linked to the information superhighway if meaningful development has to be attained in developing countries in order to catch up with the developed world and bridge the digital divide and benefit from dividends brought about by adequate connectivity.

CHAPTER I

Introduction

"From the beginning of time, technology has been a key element in the growth and development of societies. But technology is more than jets and computers; it is the combination of knowledge, techniques and concepts; it is tools and machines, farms and factories. It is organization, processes and people." The cultural, historical and organizational context in which technology is developed and applied is the key to its success or failure (Richardson, 1999).

The Government of Kenya and its development partners have had a lot of input towards agricultural extension. Notably, the European Union and the World Bank funded National Extension Program in the 1980s and early 90s. Other bilateral donor agencies have funded single or integrated projects with the bulk of the funds going toward extension.

In spite of the massive logistical and financial investments, the country finds itself reeling under devastating famines. The fragile food security situation has not however triggered civil strife. The continued food insecurity will certainly lead to future conflicts. Good conditions have to be created by the relevant authorities to forestall resource conflagrations. Ensuring food security – the basic of people to the food they need – is one of the challenges facing the world community. Meeting this challenge will require new technologies and new ways of collaborating. But technology will be fully exploited only if the knowledge of how to put them to use is widely disseminated and applied.

Various extension campaigns have been conducted using various communication channels. These include radio, television, print, and extension personnel, either in combination or singularly. With the emergence of new ICTs, there is a shift toward use of multi-media to reach wider and diverse audiences. However, of all the channels, radio has proved to be the most useful due to its wide reach.

The government and donor sponsored extension programs cannot be sustainable unless the target beneficiaries are involved in the formulation of content and approaches. It is regrettable that in the past, sustainability has never been factored into the programs, which have been 'top-heavy' with all the planning being done either in Nairobi or in the original donor country. This means that messages have been for short-term expediency based on the goodwill and generosity of donors. There have never been solid roadmaps and long-term objectives. Most donors, with the exception of a few, have insisted on their own approaches at the expense of local expertise. This has tended to alienate the people for whom the projects are meant to benefit. This calls for a rethink of the content and strategies.

Technology dissemination has to be persuasive through participatory information packaging to guarantee adoption, ownership and therefore sustainability. One of the ways of reaching the farmers has been through radio broadcasts, in English, Swahili and local languages. Radio broadcasts in local languages are regional and can therefore be classified as rural. They target particular audiences who have linguistic and cultural commonality.

Communication processes and media can be used to help rural people to exchange experiences, find common ground for collaboration and actively participate in and manage agricultural and rural development activities.

This research was therefore to seek to bridge the gaps that exist between change agents and beneficiaries in the extension programs. Special emphasis was placed on Kamba broadcasts to represent the wider domain of rural radio. The term rural radio was used interchangeably with community based radio.

1.1 Problem Statement and Analysis

Inadequate information campaigns or campaigns done without proper background conceptualization of messages and needs assessment (audience studies) is one of the factors that can be attributed to low adoption. There is low technology adoption that can directly be attributed to radio broadcasts. This is partially because of limited ownership of radio sets and to socio-cultural dispositions. Those who own them tend to prefer more entertaining programs in other stations.

The purpose of the study was to establish the weaknesses and suggest ways of improving the communication aspects of technology transfer by incorporating new information and communication technologies (ICTs) in radio broadcasts through local appropriation. It is hoped that the findings will help policy makers, media outlets and rural communities to seek stakeholder input whenever they embark on campaigns through rural radio.

1.2 OBJECTIVES

1.2.1 Overall Objective

To reflect on the potential offered by rural radio as a development tool in technology dissemination and adoption.

1.2.2 Specific Objectives

1. To evaluate the effectiveness of Kamba radio as a representative of rural radio in Kenya.
2. To do a comparative assessment of the strengths and weaknesses of radio broadcasts with other communication channels.
3. To provide information in support of the area of research and discourse on ICT appropriation, namely that of "local appropriation".
4. To present new trends in the field of rural radio in the demand-driven message packaging through participatory approaches.
5. To draw attention to the need for a greater focus on grassroots, community-driven projects and initiatives involving ICTs.
6. To highlight the pressing need for monitoring, evaluation and participatory impact assessments of ongoing ICT projects and initiatives, especially with regards to their effect on the economic and social livelihoods of communities.
7. To present a selection of "good practice" cases with the aim of promoting sustainable community development through the local appropriation and application of ICTs.

8. To draw on a review of the cases in order to identify some guiding principles for promoting socially and culturally appropriate community-based ICT initiatives.

1.3 Justification

Since independence, the Government of Kenya has invested heavily in the provision of extension services to its farmers. These efforts have not met the objective of attaining sustainable food security. There is need therefore of evaluating the entire information and communication packaging in order to realize adequate technology dissemination and adoption. This will be in line with the Government's commitment to fight poverty through adequate provision of the means to attain food security. The current clamor for national improvement should also be geared toward bridging the gaps created by past haphazard technological transfer through proper audience studies and message packaging.

One of the ways of ensuring that messages reach the intended targets is to package and deliver them in the language(s) best suited for particular audiences. In Kenya, rural radio has a powerful influence on the rural peasants who contribute 70% of the agricultural output. However, not much has been achieved hence the need to incorporate new techniques. Communication is a dynamic field with new information and communication technologies (ICTs) providing new avenues of reaching audiences. There is need therefore of evaluating the current status of technology dissemination to ascertain whether they are in line with modern trends and expectations.

1.4 Target Beneficiaries

The worst hit farmers are those in ASAL and densely populated areas of the country, who have to depend on food doles every year due to crop failure and diminishing land holdings respectively. This is in contrast with their counterparts in countries like Botswana, Israel, Egypt, and the Latin American nations who have adequate incentives and information on the agricultural inputs and outputs, especially on marketing. The research report will benefit policy-makers in formulation of farmer-friendly food security measures, particularly in respect to information dissemination and diffusion.

The report will also provide a benchmark for reorientation of training and provide a fulcrum for new thinking in the professions involved not only in agricultural extension but also in the entire spectrum of change agency.

CHAPTER II

2.0 THEORETICAL FRAME OF REFERENCE

This chapter attempts to propose a framework for the study of the effectiveness of rural radio in technology dissemination particularly that of agricultural technology, based on the models and concepts from various disciplines and past research in communication. Reviews of communication literature show that diverse theories converge to provide wider meaning toward technology dissemination and adoption. Early researches showed that the media have a powerful effect, a phenomenon that made the media to act like a “magic bullet”. As early as 1895, Gustave Le Bon, a French social psychologist, characterized modern society as being in “the age of crowds” (Shearon, 1988).

For purposes of this study, six models were given prominence; (a) The diffusion theory, (b) The uses and gratification theory, (c) the two-step flow theory, (d) the knowledge gap theory, (e) The social learning theory, and (f) The spiral of silence. The models of cognitive dissonance, agenda setting, gate keeping, and agenda setting were only mentioned to reinforce the five lead theories. All these models subscribe to the paradigm of selective effects that was developed by researchers for decades after 1930s to contradict the magic bullet hypothesis. They posited that there was selective influence based on social relationships and social categories. The models depict individual as psychological machines and attempt to account for behavior by

appealing to the concept of “needs”, with the need for self-actualization being super-ordinate (Maslow, 1953).

2.1 Theoretical Descriptions

2.1.1 The Diffusion Theory

Diffusion refers to the process an innovation is communicated through media and interpersonal channels over time among members of a community. How quickly an innovation diffuses depends on several factors such as cost, observability, compatibility with existing ways of doing things, complexity of the idea, relative advantage against existing ideas, triability, and the remaining useful life of the innovation that is to be replaced. Basically, the classical diffusion model as described by Rogers with Shoemaker (1971), distinguishes four main elements in the diffusion process: (a) the innovation, (b) which is communicated through certain channels, (c) over time, (d) among the members of a social system.

Certain prior conditions can affect innovation diffusion. These include previous experiences people have had with similar technologies. Another condition is the *innovativeness* of potential adopters. In other words, some people are more inclined than others to try new gadgets, music and even clothes.

Diffusion of new communication technology goes through a predictable sequence of stages. First, we gain knowledge about the new idea from the media and from the people we know. Then we weigh the merits of trying it. Finally we decide to try it, and we implement that decision if we still believe

that the innovation will do desirable things to us based on the motivation to adopt by the dissonance between what we believe and what we are doing. Afterwards, we continue to reassess our experience with the innovation and either confirm, reject, or modify our use of it.

People do not adopt at the same rate. Those who first use the innovation are called innovators. People who follow up on innovative ideas through specialized media such as trade journals or interpersonal contacts are early adopters. Those who join the trend as it starts to go mainstream make up the early majority. Those who wait to see what most people are going to do constitute the late majority. Those who wait until the very last end are called the laggards.

Innovators can sustain their innovative behavior despite possible failure, high risks, and lack of social support through self-reinforcement mechanisms, while the majority of the adopters depend on vicarious reinforcement (seeing the advantages gained by early adopters) before embarking on innovative behavior. Thus, modeled benefits tend to accelerate diffusion by weakening the restraints of the more cautious potential adopters. Innovators and early adopters become effective models if they possess prestige, power, competence, expertise, high socio-economic status, and assumed similarity between them and potential adopters.

Interactive communication technologies diffuse in a characteristic way. First, a certain minimum number, or critical mass, of adopters are necessary for it to

be useful enough for most people to go along with the trend. Innovations then diffuse through the social networks that people form.

In the context of this study, an attempt was made to assess the diffusion of technology mediated through radio and how social networks complement mass media in the ultimate success of information flow and adoption.

2.1.2 The two-step Flow Model

The basis of this theory was a study conducted by Carl Hovland and others in the Erie County, Ohio, on the 1940 presidential elections. The research was called the Decatur Study and was meant to evaluate the level and impact of interpersonal communication in the diffusion of campaign messages. On the basis of that research, it was found that though media, particularly radio, had a powerful reach, interpersonal communication plays an important role in facilitating diffusion of campaign messages among members of social groups. Information first reaches the primary group or the opinion leaders who subsequently pass it on to other less innovative members of the community. The latter groups are influenced by the former and in the process create social realities especially in the areas of marketing, fashions and movie selection (Lewin, 1940s). Earlier researchers had proposed that the media have an all-powerful influence. However this was disputed with the findings that media effects are selective depending on the selective perception of audiences. Mediated messages are received and interpreted differently by members of a community depending on their socio-economic status, education level, gender, age and even race.

Harold Lasswell, conducting persuasion research at Yale in 1953, found out that different people were/are persuaded differently and that interpersonal relations play a pivotal role in creating media realities.

Project Revere also was instrumental in the evaluation of leaflets in campaigns and the subsequent message diffusion, distortions and accuracy. President Truman was keen and eager to drum up support for military intervention in the Korean crisis of 1951-53. Earlier in 1945, leaflets had been effectively used to convince the Japanese that further military resistance was futile. The idea of using leaflets was mooted as a way of reaching diverse and disparate communities who could not be reached through conventional media.

The limited success that the leaflets achieved was/is testimony that print could and cannot be relied upon as the only medium to reach wide audiences given its vulnerability to distortion and the logistical nature of application. Radio, being available and given its low literacy requirement, is more widely accepted and particularly when used in local languages.

2.1.3 The Agenda-Setting, Gate keeping and the Spiral of Silence Models

In 1974, Prof. Elizabeth Noelle-Neuman, a German sociologist, postulated that one's own opinion is largely dependent upon what others think or, rather, upon what one perceives as the prevailing opinion of others. When certain members of an audience receive information, they tend to keep it to themselves till they are convinced that other members of their group have

similar information. In the process, they withhold vital information that could be disseminated. In the meantime, their colleagues discuss the information openly. The silent members are in the vicious cycle of silence and as long as they don't involve themselves in discussion forums, they remain ignorant. Another aspect of the spiral is that the silent members of an audience tend to believe in what others think. This is a very vulnerable group especially to propaganda messages as they rely on the 'majority voice'. Wilbur Schramm calls this '*landslide effect*' in which people follow what the majority believe in, even if wrong.

Radio being a strong medium can be used to disseminate technology using the landslide effect philosophy- if you are not with the majority, then you are wrong. The less innovative members of a social system can easily be convinced that others have adopted a technology and therefore should join in.

There is a constant flow of information from the media to the audience in topics and issues that seem important to those who manage the media. In the 1940s, Walter Lipmann of the *Washington Post* talked of the agenda-setting function of the media. The information forces attention to the issues and builds public images. By setting the right developmental agenda, the media can shift people's attention to the life supporting issues like food security. According to Donald Shaw and Malcolm McCombs (1977), the relative importance attached to an issue depends on the media treatment of the issue. The prominence given to the Watergate scandal made it the topic of the year.

The media cannot tell us how to think but can tell us what to think about. In the *Chapel Hill* study of 1968 and the *Charlotte* study of the early 1970s, researchers concluded that since people had limited opportunities to observe things first hand, they depend upon the media to provide them with this information. However, there exist a gap between media account and the true or actual occurrences. Similarly, the prominence media give to events can also result in audiences developing perceptions about the events.

The conviction that media shape ideas is old, as shown from researches done by Kurt Lewin (1947), and White (1950). The agenda set in the public domain depend on the 'gatekeepers' who constitute the program directors, and the editors, who decide which items to pass, filter (edit), and which to reject. News media clearly state the value they place on the salience of an item through placement, repetition, timing and reinforcements by commentaries and opinions. Gatekeepers do not act in a vacuum but rather are guided by the overall objectives, resources, mission, and vision of the station.

2.1.4 The Knowledge- Gap Theory

This theory develops a framework in which different layers in society receive and utilize information at different rates depending on their innovativeness, social class, and the potential usefulness of the innovations. Tichenor and others did the first research on the knowledge gaps in 1973. Those who have access to information and utilize it tend to improve their lot faster. Those without access commonly referred to as the '*have-nots*', remain ignorant and *knowledge-poor*. With time, the gap between the two groups widens and two

distinct groups emerge, leading to social stratification. Many studies have documented that information gaps are widened by the media (Gaziano, 1997), even by such well-intentioned efforts as *Sesame Street* that are specifically designed to close the gap. *Sesame Street* were programs that were designed to target the less privileged and the minorities in America. However, the 'haves' also attended more to the media than the audiences who were the original targets. Subsequently, the gaps that were meant to be bridged, instead widened further.

On a global scale, this gap creates the digital divide between the '*developed world*' and the '*developing world*'. Radio, being an ICT tool also tends to widen the gaps. However, if utilized effectively, radio can bridge the gaps. Access to radio sets and radio broadcasts is not the only way to access audio information. The programming tends to determine the kind of information disseminated and its usefulness. One approach therefore is *community networking* (LaRose, 2002), which offers access to information in the content and simplicity adapted to local conditions. The premise is that community-based resources tailored to local needs by community members themselves will close the gap.

2.1.5 The Uses and Gratification Theory

This theory deals with media consumption behavior based on an active audience. Most research in this field has been done by Suchman (1942), Herzog (1944), Berelson (1949), Katz and Lazarsfeld (1955), Katz et al (1974), Host (1979), and McQuail (1979). They all concluded that media users

actively seek out media that meet their needs for new knowledge, social interaction and diversion (LaRose 2002). Gratification is the satisfaction one obtains when utilizing a service.

In radio broadcasts, the tastes one develops and the program preferences of an audience dictate the attendance to media. Programs are therefore focused on a very narrow audience, a process called *narrow casting*. This means that channels are more specialized to meet the needs of their listeners. The concept of how needs influence behavior can also be extended or explained by the *cognitive dissonance theory*. Needs are assumed to be a result of “discrepancy or inconsistency.” Festinger (1957), in his theory of cognitive dissonance, retained the notion that discrepancies or inconsistencies cause tension that people try to reduce or eliminate by bringing their attitudes and their actions into line.

When an individual feels dissonant, he will ordinarily be motivated to change his knowledge, his attitude, or actions. According to Rogers with Shoemaker (1971), individuals frequently try to avoid becoming dissonant in their decision to adopt or reject an innovation mainly by seeking only that information that they expect will support or confirm a decision already made, a process called selective exposure. Similarly, dissonance can be reduced by selective perception (message distortion) and by selective forgetting of dissonant information.

2.1.6 The Social Learning Theory

This theory has mainly been advanced by Albert Bandura. The basic argument of the theory is that, although people can learn through directly experiencing the consequences of their own behavior, most human behavior is learned observationally through modeling; from observing others, one forms an idea of how new behaviors are performed. Later, occasions this coded information serves as a guide for action. Most human behavior is learned observationally through the informative function of modeling. Modeling in turn is governed by the ability to observe the modeled activities, code them for memory representation, retain them, and match the modeled behavior.

Our expectations form around outcomes of behavior that can be feelings of joy (Bandura, 1986). Uses and gratification would call that enjoyment a *gratification*; social learning theory calls it an *outcome*. Social learning theory adds the influence of what we observe and the experiences of others to be. Social learning theory adds to the uses and gratification theory in many ways. It explains the avoidance of media as when the consequences are negative. This dictates media usage. Media usage and behavior are determined by inner self-regulation.

Another important factor is our perception of our own competency to consume the media in question, or our *self-efficacy*, which influences how media are used, especially by the youth. Social learning theory explains that we may generalize these bad experiences and come to associate them with the medium rather than the message. The main argument therefore is that people

possess self-reactive capacities mainly through self-reinforcement mechanisms that enable them control emotions, feelings, thoughts, and actions. Self-reinforcement refers to the process in which individuals enhance and maintain their own behavior by rewarding themselves whenever they attain self-prescribed standards.

If radio listeners find uninteresting programs, they tend to switch to stations that offer what gratifies them and subsequently leading to incidental learning. This particularly happen to both old and young media users. This emphasizes the role of vicarious reinforcement or incentives. Vicarious reinforcement is indicated when observers increase behavior that they have seen others reinforce. This is also called system effect, which is the impact of others on the behavior of an individual. The rewarded modeling is similarly more effective than modeling alone in inducing behavior. Social learning theory postulates behavior as being regulated by the interplay of self-generated and external sources of influence (Mbindyo, 1981). In summary, though radio may carry information geared toward adoption, the interpersonal interactions create an environment for rapid diffusion.

2.2 LITERATURE REVIEW

Media is one of the most powerful and influential educational tools in modern life. In this information age, electronic media has taken over the role of teacher, preacher and advocate (Lucas, 1999). Yet, as it is often used today, mass media shows no regard for the person on the other side of the communication table. In its present form and structure, it has become the

most effective tool in the pursuit of globalization and hegemony. Its very nature and structure aim at magnitude in reach where people are treated as mere numbers, nameless and faceless. The greater the reach, the greater the massiveness; the greater the massiveness, the greater the tendency towards one-way communication.

Media represents an immense power with enormous potential reach. Opening up opportunities for the intended beneficiaries of development to participate in the utilization of this powerful tool, will enable them to participate in evolving a development agenda, which can appropriately and adequately respond to their needs and aspirations. Access to media is access only to information. But access to the power of media is access to life.

To capture the interest of the many, mass media programs are well packaged in the form of entertainment, information and educational tools. However, often these programs merely become means of mass promotion. Producers are kow-towed and controlled by management policies and objectives that seek huge monetary returns or political gains at the expense of the people, and in the sacrifice of their interests. Since sophisticated mass media technology is extremely expensive, only an elite minority can afford the installation, maintenance, and utilization of such equipment.

Among development specialists, extension workers, and community leaders, it has been argued for some time that the poor themselves have to be involved in conscious action to tackle the problems of underdevelopment. In this way,

the very process of development becomes an enabling and empowering one. This concept has led to participatory development communication, a form of communication, which gives the underprivileged access not only to information but also to the control and use of media.

Although Benor and Baxter (1984) recommend regular post- training follow-ups on farmers, and allowing them to take the initiative of training fellow farmers with whom they share socio-cultural predisposition, Ronny Adhikarya (1998) of FAO espouses the concept of strategic extension campaigns (SEC) as a sure way of ensuring messages reach the intended beneficiaries. He follows the well known concept of rural reconstruction: “start with what people already know”, and “build on what they already have”. To achieve this, he recommends KAP (knowledge, attitude and practice) surveys to minimize “technology bias”, by giving adequate considerations to human behavioral aspects that may facilitate or impede adoption. Non-adoption of agricultural technologies is mostly caused by non-technological factors as social, psychological, cultural and economic problems.

The over reliance of extension personnel is neither technically sound nor operationally efficient. Some extension functions for certain purposes such as awareness creation, information delivery, motivational campaigns can be more effectively and efficiently performed by other means, channels, or non-extension groups, under the coordination and supervision of extension workers.

Radio provides the needed reach, frequency, and access to rural and remote areas, making it a promising, appropriate and powerful tool for education. In addition, ownership and patronage among poor households are relatively high compared to other media forms, particularly in rural settings. Radio has several comparative advantages over other media.

It is a dominant medium: Radio reaches even far-flung and isolated areas.

Radio ownership is higher than that of other media vehicles; therefore it is a mass-based media. Radio represents an entertainment medium and penetrates areas with few televisions and low print readership. For instance, in the Philippines, radio is the most widespread form of media with 448 stations nation-wide (Lucas, 1999). In Kenya, the radio 'revolution' has witnessed the establishment of several *narrow casting FM* stations some with community-driven content. These include *Kameme*, *Coro*, and the Kenya Broadcasting Corporation (KBC) local language stations that are region-based. Though content and objective of the former two is commercial, they tend to address issues that affect the lives of listeners.

It is an effective medium: Radio is a high frequency vehicle that caters to both literate and illiterate populations. The impact of its auditory properties on the senses helps to dramatize messages as the interactivity created enhances dialogue. Radio is flexible in shifting from one message and content to another. Both production and material costs are low. It can serve as a two-way form of communication in remote areas and provides a potential vehicle

for grassroots action and mass education. Radio is therefore more interactive as it is easily converted into call-in mode to obtain feedback from audiences.

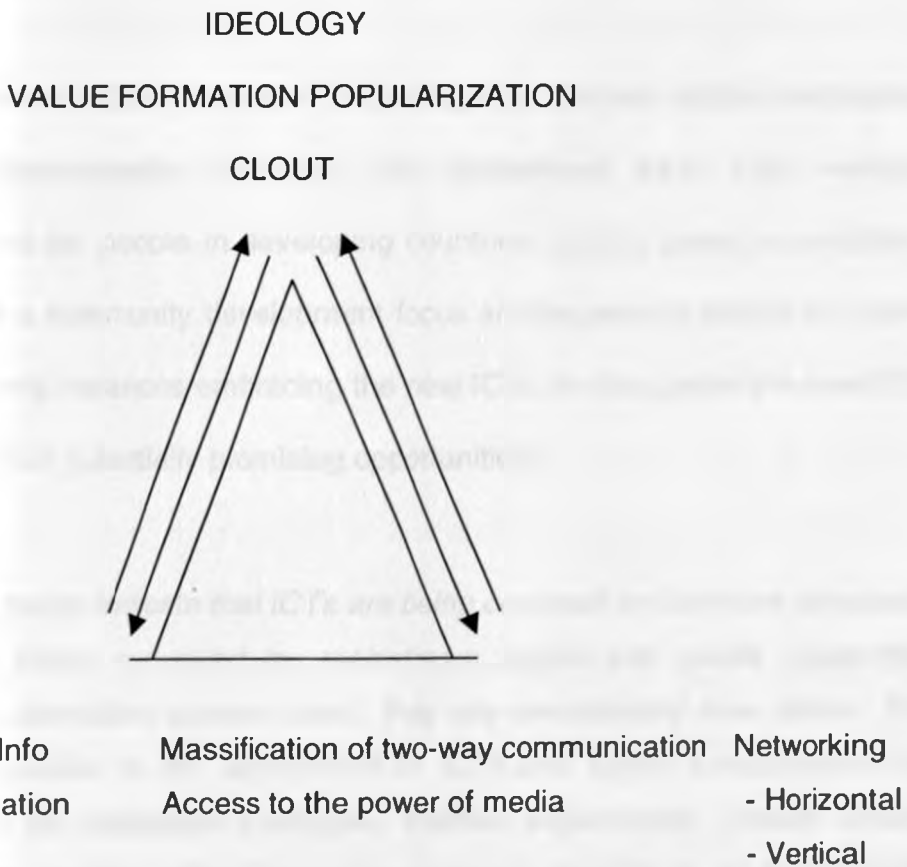
It is a cost-efficient medium: Radio is cheaper than other media. The radio sets are cheap to purchase and easy to maintain. Sound transmission is relatively cheaper than visual or audio-visual and relies on higher frequency wavelengths and microwaves. The digital recording and compatibility with the Internet reduces the broadcasting costs further.

Urgent and new ways to achieve mass education, that can be both efficient and effective, are being sought. In this context, radio, an effective telecommunications medium, has been proposed as one massive solution. Radio can cut across geographic and cultural boundaries. Given its availability, accessibility, cost-effectiveness and power, radio represents a practical solution to rural poverty. Francis Lucas, a radio evaluator quoted a Filipino woman, Aida Malandog as saying, "The radio has become our window to the world. It is my constant companion. It makes me cry, laugh, pray and learn many useful things in life" (Lucas, 1999). This was during an interview for the radio school's evaluation survey. The radio school has truly given her renewed hope in farming and life. Aida is now an active woman leader in the community.

Among the 1.3 billion poor people in the world, 70 percent are women; hence poverty typically has a woman's face. It is not surprising, therefore, that in Africa, rural women make up the most deprived and neglected sector of the

population. Rural women, like Aida, suffer from low literacy, lack of mobility, limited time for formal schooling and limited access to social services, in addition to drudgery and the overburdening of tasks. Their potential for development has not been duly recognized. Women and youth are always the ones who listen to rural radio programs deliberately or by default. Together they comprise household learners' group. Aida is very pleased that, in addition to her, three of her younger children have written to the radio school to respond to some questions discussed on the program (Lucas, 1999).

Figure 1: Power of Radio as an Educational Tool



Source: Adopted from Lucas, 1999.

Community-based radio broadcasting is achieved once a community identifies itself with a radio station and its programming. At first, it is generally very difficult for people in a community to identify themselves with a radio station given their lack of ownership of the medium. However, when people's needs are adequately addressed, they usually seek to get involved and begin to take part in programs. When people see that a radio program is meant for them and speaks about them, they come to identify themselves with the radio station. In this context, the radio has become community-based, although not necessarily community-owned.

Information and Communication Technologies (ICTs) are rapidly consolidating global communication networks and international trade with inevitable implications for people in developing countries. Locally grown organizations that have a community development focus are burgeoning across the globe, and in some instances embracing the new ICTs. At first glance the new ICTs seem to offer potentially promising opportunities.

"Current trends indicate that ICTs are being co-opted for dominant discourses such as those conveyed by mainstream media and media oligopolies. Although alternative sources exist, they are considerably less visible. This calls for caution in the deployment of ICTs and urgent consolidation and promotion of alternative strategies. Positive experiences, notably among grass-roots sectors, show that such strategies must focus on technological appropriation" (Fortier, 1999).

The information available about the effects of such wide-ranging transformations on the way people communicate and share information and knowledge is contradictory. On one hand, there is a plethora of literature on the potential benefits of ICTs as tools for enhancing people's daily lives and reducing poverty by increasing access to information relevant to their economic livelihoods, including information sources such as healthcare, transport, education and markets. On the other hand, there is an alarming lack of empirical evidence, or analyses, of actual experiences of applying ICTs locally and their impact upon poor people's economic and social livelihoods. The reality is that few projects pay attention to monitoring and evaluation of ICT outcomes, especially the local impacts of ICTs, with the result that there are no guidelines for effective ICT deployment and appropriation at the local level.

Some observers see advantages in combining the new ICTs with conventional information and communication technologies, especially with those that are popular and widely diffused such as radio, as a way to begin to close the digital divide. Radio in particular is a promising medium to be linked to the Internet since in recent years there has been evidence of a new "radio landscape" in many developing countries - i.e., privatized, deregulated, decentralized and community-based. When radio broadcasters are trained to effectively browse the Internet and integrate relevant global information with local information, radio, and especially rural radio, potentially can improve local people's access to global knowledge and information. The fact is that radio is local - in Latin America, for example, while almost all radio content is

produced locally or nationally, only 30% of television programming is from the region; 62% is produced in the United States (Girard, 2001).

ICTs, and the implications of their local applications, have highlighted the need to improve the processes of knowledge and information access, with a view towards equity and empowerment of communities in their choice, deployment and management of ICTs. There is a growing consensus that training and appropriate contents are as important as the new technologies themselves. ICTs have triggered the growth of local and regional knowledge and information networks, thus contributing significantly to South-to-South, as well as South-to-North information flows. At the same time, the new digital technologies are rapidly becoming user-friendlier, thus making both the technology and the software more accessible to a wider spectrum of users.

There is a convergence between the new technologies and conventional media that may have important implications for helping to close the digital divide. Girard (2001), discussing "next generation radio", states that there have been various experiments in Asia, Africa, Latin America, the Caribbean, and the USA and Europe using ICTs to support low-cost independent radio networks and using radio stations as community intermediaries, or gateways, to the Internet.

2.2.1 Basic Principles in CBR

Community-based radio (CBR) broadcasting for distance education can be defined as the planned and systematic use of electronic technology as a

medium to project to a mass audience, a mixed program format and techniques in order to: a) facilitate the enhancement of mass learning; b) provide a process of information dissemination; c) establish a foundation for decision making and value formation; and d) initiate behavioral transformation for social mobilization.

- *Starting where the people are.* Research is usually necessary to gain knowledge about the target audience and the surrounding environment. However, there is no substitute for the knowledge acquired through a broadcaster's visibility and sensitivity developed through extensive exposure to the community itself. This implies the absence of presumptive and fixed program ideas about development as one enters a community through the broadcast media. In Jean-Pierre Ilboudo's words, "in the past thirty years, rural radio broadcasters have produced transmissions with only a partial understanding of their listening public" (Ilboudo, 2002).. He indicates how research approaches can be used to shape the research of radio professionals, thereby helping them to better understand what listeners are seeking from radio programs and how the audience reacts to various broadcast programs. Development should consider the people's consciousness and context. It is thus important for the broadcaster to be immersed with the community itself. It is necessary to start with people's needs, desires, aspirations, and dreams, whether expressed or unexpressed, conscious or thematic. It is necessary to begin from the client's knowledge base. Education should spring from the specific contextual situation in which people are located. As Prof. Tudesq writes: "FAO has supported rural radio for the

past thirty years and, most recently, has been supporting community based radio (CBR). There is a shift toward CBR” (Tudesq, 2002). In order to be truly of service to the underprivileged and rural poor, mass media must therefore create conditions and mechanisms that can provide people with genuine access to media. Such mechanisms will offer ways in which people can express their sentiments, opinions, views, dreams and aspirations, their fears and insecurities, their strengths and capabilities, as well as their potential for development.

- *Ensuring maximum participation of the people being served.* To maintain the participatory process of development, it is vital for the broadcaster to always ensure the existence of two-way communication. The broadcaster and audience must always be in a level of continuous interaction.
- *Being sensitive.* Strict attention to the needs and culture of the target audience should be uppermost in the producer’s mind. The needs and aspirations of the community should take primacy, not the goals of the producer. Alienating the community and manipulating their culture are two of the greatest dangers in broadcasting.
- *Encouraging creativity among participants.* Creativity can be encouraged through the use of multimedia techniques such as group discussions and debates. Group processes can evoke and provoke participation and involvement that leads to concrete action. The use of area folk media can also make programs more interesting and locally specific. The creativity of participants further encourages radio

producers to be more creative in responding and attuning themselves to people's needs.

- *Basing programs on issues.* Issue-based programming is of greatest interest to target audiences. When the issues covered represent people's own concerns, the program can trigger collective action for change. People become conscious of the need for action. Provocative and evocative questions about issues of interest become very effective learning techniques for participants. People sense the relevance of what they are learning when they obtain information relevant to their communities (Gilles, 2003). West Africa pioneered rural radio, and since 1960s, has developed its own identity and unique radio style (Rakotoson, 2002).

A radio school program can create a critical mass for social mobilization, and at the same time promote sustainable agriculture. Radio school programs cannot stand on their own. If education is viewed as a "life practicum", then field programs need to be implemented alongside radio school programs to support learning. Additionally, follow-up extension programs should also be planned (Lucas, 1999).

2.2.2 What ICT Interventions Can Offer

ICTs *encourage two-way and horizontal communication* and open up new communication channels for rural communities and the intermediaries and development organizations that support them. Once mastered, they potentially allow every user to be a sender, receiver, narrow-caster and broadcaster. The

Internet, for example, has been described as a "people's network" that allows every user to be an information producer and knowledge sharer (Richardson, 1997).

ICTs *support bottom-up articulation of development issues and perceptions and facilitate the merging of global and local knowledge and information.*

ICTs *support, create, strengthen and enhance interactive and collaborative networks* that enable information to flow to and from rural communities, facilitate dialogue between communities, intermediaries and development organizations, foster co-ordination of national and local development efforts and overcome physical barriers to knowledge and information sharing. ICTs can also enhance the capacity of grassroots organizations for their voices to be heard. This is especially true of ICT projects that are managed by local communities. This includes community-owned media, especially radio.

"A FarmNet is a network of rural people and supporting intermediary organizations, such as extension services, using ICTs and conventional communication media to facilitate the generating, gathering and exchanging of knowledge and information. Operated by farmers and their organizations, FarmNet links farmers to each other and to the resources and services they need to improve their livelihoods. Design of a FarmNet with the Uganda National Farmers' Association found that the best approach was to enhance existing communication efforts (face-to-face, local radio, publications) with the use of a simple e-mail based communication system, for information on markets, improved agricultural technologies and weather conditions" (FAO, FarmNet brochure, 2000).

ICTs support articulation of policy and rural advocacy by meeting the information needs of leaders, decision-makers, interest groups and grass roots advocacy organizations. They can be activated for social networking and mobilization, to build up public awareness around development issues and for upward pressure on policy decisions.

ICTs help to build consensus and dialogue through the provision of information on government programs, policies, decisions and issues to advocates. Although Kenya has not joined the fray, many governments are putting such information on-line. On the other hand, 'terrorists' and opponents can seize the same tools for Internet campaigns to support their own agendas. Such on-line "checks and balances" of development agendas potentially can contribute to political debate and democratic processes.

ICTs enhance partnership with the media. They are particularly relevant for community media that have limited human and financial resources.

2.2.3 ICT Challenges

The digital divide has been broadly defined as "unequal possibilities to access and contribute to information, knowledge and networks as well as to benefit from the development enhancing capabilities of ICT" (Draft report of the DOTForce, 1-2 March 2001, South Africa). It has recently been highlighted as one of the most visible components of the "development divides". For developing countries, this has several potentially harmful consequences, including further marginalization (increased gender, rural-urban and poor-rich

gaps) as access to opportunities for wealth creation is reduced or polarized and potential losses of considerable development opportunities as productivity and efficiency gains are not transmitted from rich to poor countries.

A combination of inadequate national communication policies, especially the lack of an enabling telecom policy and regulatory environment; insufficient infrastructure, connectivity access and high costs; a scarcity of skilled "ICT labor force"; and a lack of local content creation and applications (language and software) hinder ICT appropriation by poor nations and by poor regions within nations, and especially by isolated rural communities. The result is that while "there are undoubtedly good reasons for the widespread belief that the Internet is a potent social and economic force, many observers caution that the new 'information marketplace' will increase the gap between rich and poor countries and rich and poor people" (Crowder et al., 1998).

New measures have to be put in place to ensure that citizens have access to new ICTs. This can be achieved through effective policies and legislations. According to David Landes (1998), Russia, poor Russia, was the epitome of state-driven development. Each effort was so exhausting in the quest to catch up with the West. Modernization from above leads to the whole country paying through arrogance, graft, greed, and resentment. Landes retorts, "The smothering of incentive and the cultivation of mendacity are a characteristic weakness of a large and lethargic bureaucracy".

To emulate and catch up with a predecessor in industrialization, a country must have an ability to leap the gap the gap for knowledge and practice separating the backward economy from the advanced (Gerschenkron, 1962). He saw the gap as an incentive in itself, an invitation to effort – like a gap in potential that, when sufficiently great, is crossed by electrical energy in the form of a spark. There is tension between 'potential' and actual. In Gerschenkron's model, then, it pays to be late. Not before the leap but after. The greater the gap, the greater the gain for those who leap it. This is because there is so much more to learn- including the mistakes to be avoided hence follower countries growing faster than their predecessors, growth characterized by what Gerschenkron calls '*spurts*'. Growth also tends to adopt the most modern and efficient techniques.

The reality is that the impacts of ICT applications on local communities are difficult to foresee, or even assess. Until people start to capitalize on the various experiences in experimenting with, adapting, and "transforming" the new technologies, community-based ICT projects may not be seen to offer any real or direct benefits. Benefits are even more difficult to reap given that ICTs are found mainly in urban centers and thus are largely out of reach of people living in rural areas. Moreover, due to lower rates of literacy, women (and marginalized groups in general) are not given equal access to the benefits of ICTs. The diminishing costs of computers and Internet access would seem to make knowledge and information more widely available, but poor nations face organizational, training and costs constraints.

"People's media are owned and controlled by the powerless with the intention to empowering themselves. They are a direct confrontation of the disempowered with the dominant communication structure. They select different themes and discourses, tell their own stories and articulate their fears and dreams in the cultural idiom of their own communities" (Hamelink, 1994).

2.2.4 Technology Appropriation

This is how people appropriate technology tools to express and share ideas that would otherwise go unnoticed by their peers, families, communities and societies. Community radio, home grown web sites, participatory video, locally produced newsletters, etc. are great examples of this." (Richardson, 2001).

The concept of media appropriation has roots in communication theory beginning in the 1970s. It evolved in reaction to mass media theory that posited that people are basically "duped and controlled" by the mass media. Researchers doing cultural studies decided to conduct practical participant observation research on how people interact with the media in their daily lives. They found that rather than being duped by the mass media, people integrated media within their lives and made sense out of it in locally specific ways. Some researchers and theorists took appropriation further - seeing it as a sign that people consciously or unconsciously resist the "hegemony" of the mass media through simple everyday practices of ignoring, modifying and appropriating media messages. Another trend was to look at how people, in everyday life, use the media tools at hand to appropriate not only messages, but the means of media production; graffiti, community radio, small format video, local art and popular theatre and song are all examples of such practices.

Local appropriation of ICTs is about communities and groups selecting and adopting communication tools according to the different information and communication needs identified by them and then adapting the technologies so that they become rooted in their own social, economic and cultural processes. It is about creativity and freedom of expression and in some cases about resistance to political and cultural dominance and to global and national media and idea markets that are dominated by a handful of transnational companies and conglomerates. Appropriation is about power - power over the tools and content of communication.

Local appropriation of ICTs is important because it can:

- Contribute to reducing the digital divide (as well as rural-urban, wealth and gender divides) at individual, group and community levels.
- Give a voice to the voiceless (at household, community, national, regional and global levels). For example, communication processes can give rural women a voice to advocate changes in policies, attitudes and social behavior or customs that negatively affect them.
- Foster and facilitate community decision-making and action and empower them to take control of local development processes.
- Advance community ownership of ICTs for development, empowering communities to take charge of all aspects of ICT initiatives, including deciding priority applications, content, training, technical management and even financing.

- Ensure that ICTs serve the purposes of local communities. Through appropriation, communities select and transform the technologies and content to fit their needs, rather than reflect the interests of external groups.

"It is difficult to see how market-driven Internet development can go beyond the small groups that constitute the professional classes. Do we need to take care that the Internet revolution does not create a knowledge caste system? Such a system could further widen the gap between the well-educated elite and the poorly educated masses."(Linda, 2001).

It is nevertheless important to bear in mind that: "ICTs are not a solution in themselves: they offer the means for communities to identify and implement their own solutions leading to their own goals in the field of human, social, cultural and economic development. It is therefore important to expand the concept of access from the right to receive information to include the notion of greater access to the means of content production. Governments and development partners can and should be supportive of this process, but the driving force is to be found within the communities themselves" (UNESCO, 2001).

2.3 Operational Definition of Terms

1. Appropriation of technology is the way people adopt the technology to fit their needs. Or as O'Farrell (2001) puts it, "it is more likely that people adapt their lifestyles to fit the technologies. Local appropriation

in the sense of ICTs as tools of information exchange and socio-human communication that are adopted and adapted by local people (individuals, social groups and communities) to meet their specific information and communication needs, and thus to express, share, gather, collect, disseminate, accumulate, distribute and analyze information and knowledge.

2. Communication channels are the means through which messages go from sources to receivers.
3. Diffusion is the systematic information flow through a community or social system.
4. Digital Divide is the global gap between those who share in the digital revolution - and the increased productivity and wealth that it creates - and those who live on the other side of the digital divide, including the more than half of the world's population who have never even made a phone call. The Internet may be changing everything for those who use it, but it is doing nothing for the poor 19 out of 20 people in the Third World who still lack access"(Hammond, 2001).
5. DOT Force (Digital Opportunity Task Force) established at the year 2000 G8 Summit in Kyushu-Okinawa when the Charter on Global Information Society was adopted. The G8 Leaders agreed to establish it aimed at integrating efforts to bridge the digital divide into a broader international approach.
6. E-commerce has no single definition but it includes "commercial activity that is somehow linked or supported by electronic communications. It may be anything from a simple advertising presentation available on

the World Wide Web, or an e-mail communication; all the way to an entire multi-million dollar transaction initiated and promulgated in electronic form up; to and in some cases including the actual delivery via the net of information intensive goods or services" (Gurstein, 2000).

7. Extension is the process of transmitting technology using any of the communication channels for purposes of improving the production, distribution, and consumption processes.
8. Information and communication technologies (ICTs) can be defined as a range of electronic technologies which when converged in new configurations are flexible, adaptable, enabling and capable of transforming organizations and redefining social relations. ICTs combine technical, functional, organizational and human characteristics that influence communication processes and information content. ICTs can include the Internet, e-mail, mobile phones, digital cameras, networks, radios, databases, portals and software. ICT skills enable people not only to be users but also "brokers" in helping communities to appropriate ICTs to their own needs.
9. Innovation is an idea, practice, or object that is perceived as new by an individual or other relevant unit of adoption.
10. Innovativeness is the degree to which an individual is relatively earlier in adopting new ideas than other members of his social system.
11. Kamba is an ethnic group in Eastern Province of Kenya. Kamba will both refer to the ethnic group and the language spoken by the same.
12. Mass media are media that are meant to convey information to a wide audience. Mass media include, but not limited to, radio, television,

printed and, material. They mediate between the sender and the receiver.

13. Opinion leadership is the degree to which an individual is able to informally influence other individuals' attitudes or overt behavior in a desired way with relative frequency. *Opinion leaders* have a high propensity to seek information about innovations and a high contact with the media.

14. Rural Radio. For purposes of this study, rural radio will be used to mean vernacular radio or community based radio (CBR). These are radio channels geared toward addressing the issues that affect the people in the immediate neighborhood.

15. Social system is a collectivity of units that are functionally differentiated and engaged in joint problem solving with respect to a common goal.

16. The North refers to the countries that form the developed bloc. These are in Western Europe and North America.

17. The South refers to the countries that are 'developing'. They are also called the Third World.

18. Theory, which can also be referred to, as ideology, postulate or model is a set of ideas or assumptions that try to explain a phenomenon. When a phenomenon is explained by one theory, then the set(s) of theories are referred to as a paradigm. Theory demonstrates commonalities in phenomena. Commonality helps to link and predict events.

CHAPTER III

3.0 RESEARCH METHODOLOGY

The research was based on field surveys, library research, and consultations with experts. The paper is exploratory and descriptive. Two questionnaires were used; one for extension personnel and radio program managers and another for farmers. There were closed and open-ended questions that were administered informally through face-to-face interactions.

The research sought to illustrate the potential of mass media, and in particular radio, to reach rural populations largely untouched by formal education programs. It discusses the benefits of using radio as a medium to reach the poor, as compared to other types of media. It also compares the potential of radio school to other educational programs such as classroom teaching or farmer field schools. Radio is not advocated as a substitute for more formal types of education. Rather, the research sought to demonstrate how, in situations characterized by high illiteracy and limited resources, radio has the potential to reach the greatest number of rural households in the most cost-efficient and time-efficient manner, thereby achieving a critical mass in terms of impact.

In particular, the case studies set out some basic principles of community-based radio and proposed a framework for a community-based radio distance learning system. This conceptual framework included a discussion of the four

key elements of a community-based radio distance learning system that is context, content, format and process. It also provided a seven-point checklist/ good practice criteria to strengthen curriculum design for community-based radio learning.

3.1 Scope of the Study

Given the time frame (two months) and the desk-based nature of the study, the information was obtained primarily through Internet searches, personal contacts and literature review. The research report is mainly descriptive, and will not pretend to be an analytical assessment of the outcomes. The aim was to select projects and initiatives that are representative of "local appropriation" (i.e. that are community-driven and therefore have a strong component of community participation and ownership).

3.2 Research Area

The field research was conducted in Kathonzweni Division of the ASAL District of Makueni. Library research was done from the ACCE library, UNESCO and FAO libraries in Nairobi. The District was selected due its strategic location in the crop-livestock dynamics, land use systems, proximity to Nairobi, and logistical convenience. The area has also had a lot of input from donor-funded singular and integrated projects.

Kathonzweni Division is one of the sixteen divisions of Makueni District. It is administratively divided into six Locations viz. Kathonzweni, Kithuki, Kitise, Mavindini, Kanthuni, and Mbuvo. It lies in an area with transitional agro-

ecological zone IV-V, characterized by dry spells, poor soils and heavy settler influx. The delicate ecological balance is therefore severely threatened hence the need to employ effective food production techniques. The Division was settled in the mid 1960s and had hitherto been a wildlife sanctuary. The Division is relatively populated and has 22,500 households, which translate roughly into a population of about 135,000 inhabitants. For purposes of the study, literacy levels and communication infrastructure were considered.

The division relatively has inadequate communication infrastructure and this has been partly due to the low-income levels in the division and partly due to negligence. However, the division has high potential especially in irrigated agriculture. Literacy level is about 40%, which is almost the national average. The telecommunication facilities like are obsolete and cannot have the carrier capacity that the new ICTs require.

3.3 Research Period

The research period was between July and October 2003

3.4 Sampling and sample unit

A sample of 30 farmers was selected to represent the entire district and by extension the entire farming community in Kenya. A random sample was picked through stratified and purposive sampling techniques. Out of each of the six locations, five farmers were selected. However, for the professional technical questionnaire, selection depended on availability and the perceived resourcefulness of the professional staff concerned.

3.5 Project Strategies

- 1 Building on the existing strategies and incorporate traditional knowledge systems to attain maximum returns for investments.
2. Conducting an appraisal on the impact of the current radio extension approaches from the farmers' perspective.
3. Conducting a content analysis on existing radio extension materials and determine their relevance.
4. Evaluation of the radio channels in use from stakeholder perspective.

The research looked at different cases of ICT appropriation to see how people and communities have approached the challenge of increasing access to information and communication resources. Special emphasis was given to participatory approaches because participation is one of the key issues surrounding equitable access to and empowerment through ICTs. Several "good practice" criteria were developed to assess the case examples identified during the study.

The criteria were whether broadcasts are:

- Community-driven
- Innovative
- User-friendly
- Sustainable
- Transferable
- Gender/youth-sensitive
- Have a training component

3.6 Research Schedule

<u>Date</u>	<u>Activity</u>
July 1 – 31	Proposal writing
August 28	Submission of draft proposal
September 10	Submission of final proposal
Sept. 1- 20	Field survey
Sept. 20-25	Data analysis and interpretation
Sept. 25- 29	Compiling report
Sept. 30	Submission of draft report
Oct. 5	Submission of final report
Oct. 10	Defense of report – colloquium

3.7 Assumptions

1. That rural radio is an effective agricultural campaign channel.
2. That new ICTs can transform rural radio and make them more useful than they are now.

3.8 Limitations

1. Limited time to conduct an exhaustive survey.
2. Limited resources to reach and cover a wide client base.
3. Low literacy level on the part of respondents that will limit use of simple questionnaire.

3.9 Monitoring and Evaluation

There was continuous monitoring on the project progress based on a set of indicators. The indicator in this case was the rate of questionnaire administration and the production of a project report. Self-evaluation was to be coupled with that of the supervisor. At the end of project, the compiled report, after going through the supervisor, will be distributed to various stakeholders who will benefit directly from the input.

CHAPTER IV

FINDINGS

This chapter deals with the findings from the field, and library case studies, and discusses them in the perspectives of ICTs. The chapter gives a description of findings, outline of case studies and perspectives in reference to rural radio and ICTs.

4.1 Findings

Kathonzweni Division is a dry area with features that make it relatively less habitable to human beings. However, with the right technology, the area can be turned into a very hospitable place. The proximity to river Athi provide an excellent opportunity for irrigated agriculture and the popular but less developed goat rearing.

Figure 2: Dry and parched area Next to river Athi in Kitise Sub-location of Kathonzweni Division. This is the typical characteristic of ASAL areas.



The picture shows overgrown shrubs of *Balanites Aegyptica*, locally called *Kilulu* (Sing.), which are a delicacy for goats. In the background is the Yatta plateau on the Kitui side of the river.

Source: Own picture taken in 1997.

4.2 Demography and Resources

The respondents ranged between the age of 31 to 67 years and all of them were either owners of land, or wives of the landowners. No woman owns the homesteads in terms of title. All respondents were mixed farmers, rearing cattle, goats and poultry and growing all the common cereals and legumes, with land holdings of between 20-50 acres. On-farm income is low and only exceeds off-farm income in what the respondents called 'good years', when there are adequate rains. Off-farm income sources include salaried jobs, remittance from spouses and 'children' working outside the area, and rents collections for propertied respondents. The proportion of on-farm income to total income ranges between 30-70%, with average monthly income levels of between Ksh.5, 000 -10,000.

Table 1: Income levels, sources, and proportion to total income for farmers in Kathonzwani division, showing the % of respondents in each category.

Income range	On-farm	%	Off-farm	%	Total %	Remarks
0-1,000	0	0	2	6.67	6.67	Few respondents fall in this category and by extension, few rural people.
1,000-5,000	7	23.33	4	13.33	36.66	Most farmers fall in this category, especially in the areas bordering Kitui district.
5,000-10,000	14	46.66	3	10	56.66	This is a category considered relatively elitist.
Total	21	70	9	30	100	

Source: Own Field Research, 2003.

Table 2: Ownership of power sources and media receptors.

Location	Kathonzweni	Kitise	Kithuki	Mavindini	Kanthuni	Total	%
TV	3	2	1	1	0	7	23.33
Radio	5	5	5	5	5	30	100
Battery	4	0	1	1	0	6	20
Solar panel	2	0	0	0	0	2	6.67
Mobile phones	4	2	1	1	0	8	26.67

Source: Own Field research, 2003.

Radio is the only communication equipment with widespread ownership, as shown above.

Although school enrolment nowadays is high, literacy levels among the old are low as shown in the table below.

Table 3: Education levels among respondents.

	Primary & below	Secondary	University	Informal & <i>Gumbaro</i>
Number	9	4	0	17
%	30	10.33	0	59.47

Source: Own Field Research, 2003.

Most of those who claimed to have self-education are the old who either worked as laborers in colonial homes or benefited from the '*Gumbaro*' free adult education classes in the 1980s.

All the farmers have attended to at least one training module offered by the extension division of the Ministry of Agriculture and other extension providers. One of the two respondents who received formal training is a retired frontline extension worker in the Ministry of Agriculture. The other was a forest technician until he was retrenched.

Table 4: Communication and energy infrastructure development in various major market centers of Kathonzwani Division.

	Kathonzwani	Mbuvo	Kitise	Mavindini	Kanthuni	Kithuki
Electricity	Non	Non	Non	Non	Non	Non
Analogue phone	Yes	Non	Non	Non	Non	Non
Digital phone	Non	Non	Non	Non	Non	Non
Generators	4 in schools	1 in health center	1 in school	1 in school	Non	1 in school
Solar panels	Several	Several	Several	Several	Several	Several
Battery chargers	2	Non	Non	Non	Non	Non

Source: Own Field Research, 2003.

Those who own batteries have to recharge them far away from home and at an exorbitant fee. In Kitise, the respondents were eager to have community TV sets especially during major events like the World Cup.

Table 5: Extension outlets.

Formal Training	<i>Baraza</i>	Radio	Television	Field days	Agricultural Show
2	30	9	0	26	4

Source: Own Field Research, 2003.

All the respondents have attended the local chief's gathering, commonly referred to as *barazas*. It is during the *barazas* that extension officers pass messages to the farmers in attendance. Though radio ownership is high, most of the respondents said they aren't aware of the existence of extension programs, except the advertisers' promotional campaigns.

When asked whether they own radio sets, all the respondents proved to have radio sets of varying sizes and models. Most drew them out to confirm ownership. The respondents felt that radio broadcasts especially those that deal with agricultural technology dissemination don't address their needs and welfare. The programs are not offered consistently and some listeners just stumble on programs in the course of tuning their radios. However, when asked to confirm whether they offer extension programs, Mr. Samson Kitavi of KBC Kamba service said that the station doesn't offer the agricultural programs in either Swahili or local languages. Mr. John Osoro, the KBC radio program manager said that the station would soon start airing agricultural programs in collaboration with the Ministry of Agriculture.

Table 6: Attendance to radio on various languages.

Language	Local language	Swahili	English	Other
Attendance	30	16	1	1

Source: Own Field Research, 2003.

When asked whether they have participated in formulation of extension programs, the respondents wondered how they could be involved in the program conceptualization and production when traditionally nothing like that has ever occurred. They said that they are mere receivers of information and programs and that they readily forget about the ideas being offered if they attend in isolation. They can only discuss the topics if they happen to attend to programs in groups or if reminded about them soon after the execution of any extension task. There is a lack of local participation in the creation of content and shaping of extension programs, and by extension, radio broadcasts. The figure below presents findings from the field.

Table 7: Extent of involvement in various phases of extension planning process.

	Conceptualization	Planning	Implementation	Monitoring
Yes	0	12	12	3
No	30	18	18	27

Source: Own Field Research, 2003.

Out of the 30 farmers who were interviewed, none has been involved in the identification of problems that need or require interventions. Those who are involved in the planning process happen to get involved in the implementation phase. The numbers of respondents who are involved in the two phases are reduced during monitoring, in which only leaders or their representatives and administrators together with the implementing agency are involved. Conceptualization was meant to mean identification of problems that need interventions. The planning phase is the identification of tasks, assigning duties to each player, and allocation of resources to each task. Implementation is the actual execution of tasks and taking responsibilities. Monitoring was explained to mean the continuous assessment on the progress of projects.

Figure 3: Farmers in a PRA in Kavingoni sub-location, Kathonzwi Division.



Source: Makueni Agricultural Project (2000).

Participation even in non-ICT communication programs like PRAs is limited to those who have the privilege of living in areas covered by donor-funded focal development projects, like Rose Kivondo of Kavingoni Sub-location, or areas identified as catchments, which have relatively high concentration of extension activity. This shows that participation in development of new ways and processes of accessing information and innovations are not uniform and are still low.

The farmers were almost unanimous in endorsing radio as the most accessible medium within their reach and at their disposal. Some, like Mwaniki Tutu, walk around with their sets, attending to news and programs. Why? "They are affordable and portable". They would wish to have other sources of information like print but some cannot read.

Table 8: Comparative media availability and effectiveness in rural settings

	Cost	Convenience	Ethics	Inclusivity	Impact
Radio	1	1	5	3	4
Visual	3	2	4	4	3
Audio- visual	2	3	2	2	2
Print	4	4	3	5	5
Interpersonal	5	5	1	1	1

Source: Own field Research, 2003.

On a scale of 5 the media were ranked with 1 representing the most useful in each category per unit audience. Each farmer was asked to rank the media and the results were totaled. The medium with the lowest score was taken to mean the most liked in each category.

Radio scores highly on convenience and cost. Inclusivity deals with issues of actual or potential interactiveness. Impact was explained to mean the medium, whose use has the highest possibility of making an innovation more likely to be adopted. Audio-visual channels, which mean television, film and video, are the best as per the ranking. However, their utilization is limited due to low access to the gadgets. Interpersonal communication involves the use of extension officers or farmer-to-farmer contacts. The farmers felt that the issue of using extension workers is expensive and intrusive because the officers plan for many projects around the time when they are involved in other activities like ploughing, planting, weeding, and harvesting.

Some of the respondents have heard of the Internet but none has ever used it. The only cyber cafe is in Wote town, the District Headquarters, which is far, and none of them can use a computer. They were surprised to hear that computers can enable one to access information stored in a library or read a daily newspaper.

When asked to evaluate the effectiveness of agricultural programs vis-à-vis other radio programs, the farmers lamented that they sometimes rely on

programs that advertise agricultural inputs, and cannot distinguish between them and regular extension broadcasts. The programs are not interactive and the many questions that they would want to ask are taken to the chiefs *Barazas* or to agricultural offices where they are not immediately given adequate answers.

From observation, there are limited cases of community-driven communication initiatives as exemplified by the participation in PRAs and other participatory planning processes. There are no ICT initiatives and there are no signs of any such programs being initiated soon. The extension personnel contacted have misgivings about their ability to access material from the Internet, though they claimed to be computer literate. It is clear that it will take a long time before the communities are able to appreciate the ICTs and therefore, the onus is on the extension staff to access and avail modern technological ideas and information. However, eight of the farmer respondents had mobile telephones, a clear indication that given the right incentives, the community would adopt useful technology that they perceive to be of immediate and good use to them, irrespective of the initial costs.

The respondents were asked whether they have any information or idea they would wish to share with others. Most of them anxiously said yes, but they didn't readily know what information they can share if asked to do so, and how. They said that they have received lots information most of which they cannot put into use because of the costs involved or they have better alternatives. There is no documentation on the information initiatives being

undertaken because limited monitoring and evaluation is conducted on development programs.

Priorities of most of the intervention programs seem to be influenced by forces external to the area rather than community based organizations. NGOs and development agencies operate in the old system of top-heavy planning with very limited participation of the communities concerned. Some of the agencies and NGOs operating in the area include World Vision, Belgian Technical Cooperation, Danida, Amref, Inades Formation International, and Kaoda.

Table 9: Agencies supporting projects in Kathonzwi Division, and their intervention channels.

Donor	Area of operation	Concentration	Authority	Location	Channels	Collaboration
Danida	Kathonzwi, Kithuki, Kitise	Integrated Project	Coordinating Unit	Mombasa	Interpersonal	GOK, CB
BTC	Kitise, Kanthuni, Mavindini	Agroforestry	Manager	Kibwezi	Interpersonal, Print	GOK
World Vision	Kithuki, Mavindini	Community Development	Manager	Wote	Interpersonal	GOK
Amref	Division wide	Disability	Program Officer	Kibwezi	Interpersonal	GOK
Inades	Kitise	Water, Agriculture	Country Director	Machakos	Interpersonal, Print	GOK
KaODA	Mbuvo, Kitise	Water, Sanitation	Program Officer	Nairobi	Interpersonal	GOK

Source: Own Field Research (2003).

Most development supporters are based outside the areas of operation and therefore out of touch with the people they are supposed to serve.

The market forces of demand and supply tend to dictate the provision of services. Cost sharing programs are in vogue to raise resources, adequate to meet the acquisition needs of the communities either as individuals or as groups. Target groups are however hard to identify as everybody rushes to benefit from extension laden with information of no immediate use.

The only new ICT equipment that has drawn euphoric demand is the mobile phone. Everybody was talking about poor network and many are anticipating owning the communication gadget upon upgrading of the network status. Such ICTs of immediate consumption and utility seemed to elicit fanatical anticipation. Acquisition of the cell phones could later lead to Internet connectivity when the cost of doing so would have gone down.

4.3 Case Studies

Some successful country cases were studied to assess the comparative level of ICT development vis-à-vis that of Kenya. The main source of the cases was Sabine (2001).

4.3.1 Kenya

In Kenya, NairoBits (www.naibits.org) is a locally developed ICT initiative that teaches young men from slum areas the technical and creative skills of web design enabling them to express themselves through the Internet. NairoBits was founded to realize cultural projects that would create channels

of communication between Kenya and the rest of the world. The program was initiated by two Dutch web designers who started developing a computer course that would give young people a voice on the Internet. Instead of having to consume information, these young people would be taught how to create their own. The initiators realized that the Internet could provide relatively cheap means of worldwide expression to people in the Kenya with little access to the more traditional media. For this purpose, a one-year curriculum was designed in which participants learn to become Webmasters. The idea is that once they have been trained, they then go on and train their peers. As a result of the initial phase, twenty young enthusiastic new web designers capable of training others were trained. This culminated in an exhibition of their creative efforts in the National Museum of Kenya, and a virtual dialogue with computer students from other countries, and a website for the Mathare Youth Sports Association (MYSA).

The training given to the young people of Mathare has had a positive impact on the community. Aside from the participants, their family, friends and co-members of MYSA have become acquainted with computers and the Internet. Some of the youth have become good web designers.

In Makueni, Mrs. Lilian Beam's foundation has opted to support a resource centre at Kathonzweni market to enable the community to access information through documentation of text information and provision of computers. However, the project takeoff has been dogged by poor basic energy and communication infrastructure in the area.

4.3.2 Niger

The people of Bankilare area in Niger have had access to radio for a while but felt they needed some way of expressing and disseminating their own ideas and thus, the concept of owning and operating a local community radio station was taken into consideration. A Community Information Center (CIC) was created where information is exchanged, discussed, analyzed and applied to community life. The Center is in a small, one-room sun-baked brick building but uses solar-powered transmitters that receive information from a geostationary digital satellite. The station soon became an essential part of community life in Bankilare, announcing weather conditions or alerting the community to potential disasters such as fires as well as providing information on topics such as health, nutrition, trade, environment as well as offering entertainment. The Community Information Center is linked to the Africa Learning Channel and transmits multimedia information from the Internet, targeting specific audiences where Internet connections are unreliable and/or expensive. Bankilare uses listening groups and their policy is "one receiver reaching many ears". The Center, which up to only a few years ago, received next to no information, now receives information from around Africa and the world, with an audience of 1.2 million.

4.3.3 Uganda

The Nakaseke Multipurpose Community Telecentre and Library Pilot Project, north of the Ugandan capital of Kampala, was once a town that didn't even have access to local newspapers. Now, a modern telecentre and library

complete with textbooks in English and the local language serves not only the local people, but also neighboring communities. Services offered include computer applications, training, Internet, and e-mail, along with several business services such as photocopying, telephone and fax. Trainees were selected from the community to support the technical aspects of the Center and in turn, offer training to others. Although the telecentre is for the whole community, particular attention is given to women, youth, children, the media community, workers, teachers, students, farmers, and local leaders. A local steering committee representing each of the core target groups was elected by the community to supervise the telecentre's daily activities, liaise with the management committee and mobilize the community. The Telecentre has revitalized rural community life and training in computer services at the telecentre has led to the growth of a number of core group skilled people within the local community.

In the same country, the Sapphire AIDS Victims Fund uses the Internet to sell local handicrafts in order to get money and help women who have AIDS. The funds are then used to support AIDS children and orphans. Its main mission is to ease the suffering of children orphaned by AIDS. The organization tries to not only meet their physical needs like clothing and food, but also their emotional and psychological needs.

The Sapphire Women engage in traditional basket making, a tradition that has been handed down through generations and then sell the products on-line through PeopLink (USA), a non-profit organization helping producers in

remote communities all over the world to market their products on the Internet. PeopLink is also building a global network of Trading Partners (TPs) that in turn provide services to several community-based artisan producer groups. PeopLink equips the TPs with digital cameras and trains them to capture images and edit them in a compressed format suitable for transmission via the Internet. They then place images of the crafts and promote them to retail and wholesale buyers in the industrialized countries.

4.3.4 South Africa

Kgautswane is a deep-rural village in South Africa with no electricity and prior to the ICT project, with no telephone access. The community in Kgautswane already had a Community Building Program and understood that not having access to new technologies was marginalizing the people who live there. For this reason, they asked for assistance in creating an Information Center with computers (PCs) and access to Internet. The project was funded by the World Bank to provide access to computer equipment, business-related equipment and services. The equipment consisted of an IBM server, three workstations, two small un-interruptible power supplies, modem, printer, scanner and a large custom designed desk. A generator provides power for up to 18 hours a day. The project shows how high tech equipment can be effectively used in a deep-rural setting and how a community can accept high tech solutions and integrate them into their own lifestyle. The results have shown an increase in computer literacy and ability in training others. There is now a demand for more PCs for the center. Users are able to register for and complete tertiary-

level studies via the Internet, use the African Digital Library and other free research resources made available via the Africa Education.org web site.

The Chapter 2 Network is a member-based clearinghouse of information and communication for social justice. It provides support to civil society organizations involved in advocacy in South Africa. They use the network to actively share skills, experiences and collectively engage in advocacy activities. The network uses ICTs, integrated with more conventional media, to gather and disseminate information about advocacy campaigns, train in advocacy and lobbying, undertake research on political intelligence, perform policy analysis and legislation monitoring, as well as to network and interact with other civil society organizations who are engaged in social justice advocacy.

4.3.5 India

TARAAhaat.com (www.tarahaat.com/about.htm) is a project whose goal it is to bring information and marketing services using e-business to rural India. Under the Development Alternatives Group, TARAAhaat acts as a social enterprise to promote effective e-commerce through access, content, and fulfillment. TARAAhaat provides access to a variety of information resources (health, nutrition, agriculture, sustainable livelihoods, market prices, etc.) and to a wide-range of market-based opportunities in the local language and in an incredibly user-friendly format even to low-literates. Users are able to buy seeds, machinery, spare parts, and even household items. TARAAhaat puts a

special focus on responding to the people's needs, making the network highly participatory and responsive.

Similarly, the M.S. Swaminathan Research Foundation (www.mssrf.org) has set up village centers for six villages in Pondicherry, Southern India. The objective of these centers is to enable rural families to access modern information and communication technologies in order to train and educate youth and women. They aim to build a model in information dissemination and exchange in rural areas that uses advanced information and communication technologies and generate locally relevant information. To be of use to farm households, the generic information found in the networks, particularly the Internet, needs to be appropriated into local needs. The village centers receive queries from local residents and then (re)transmit information collected from the hub.

Two important components of these centers are the sense of ownership by the communities using them and the active participation of rural women in the management of the centers. A system of close consultation between the project staff and the rural users has evolved so that information needs are realistically assessed.

4.3.6 Peru

InfoDes is a pilot project under the Intermediate Technology Development Group (ITDG) of the World Bank. Its aim is to promote local and rural development by means of effective systems of information and

communication. The goal is to contribute to the sub-regional development of Cajamarca by increasing the production levels of small farmers and the management skills of local governments, through the provision of information and communication tools. The project has designed and established a sub-regional information system that integrates conventional local libraries, research on local knowledge and the use of modern information technologies. It is also testing a methodology that can be adapted to other rural areas of Peru and Latin America. The Information System is an integrated approach that includes various levels of contact with the local population and the availability of many services. Rather than spreading computers and access to rural areas formerly deprived of these gadgets, and with no conceptual framework to support them, InfoDes has opted for incorporating existing resources, facilitating networking among local institutions and expanding the information services on the basis of user demand and community participation.

4.3.7 Senegal

Senegal has the Cyberpop, which is composed of Community Resource Centers in eight underprivileged and poor districts in Dakar and was born out of a partnership with IDRC. Cyberpop's main goal is to create the social and technical conditions to direct appropriate technologies to the community. Young managers run the Centers from community based organizations who act as intermediaries between illiterate people and ICTs. The Community Resource Centers facilitate ICT training, support knowledge exchange

between the different Centers, and intend to effectively involve the community by mobilizing local knowledge and skills.

4.3.8 Bangladesh

Grameen Phone is a commercial operation providing cellular services in both urban and rural areas of Bangladesh, with approximately 40,000 customers. In rural areas where isolation and poor infrastructure services are the norm, telecommunications can play an extremely important role in enhancing rural social and economic development. The Program is enabling women members of the Grameen Bank's revolving credit system to retail cellular phone services in rural areas. This pilot project currently involves 950 village phones providing telephone access to more than 65,000 people.

Village women access micro-credit to acquire digital GSM cellular phones and subsequently re-sell phone calls and phone services within their villages. The Village Phone is a communication tool that provides real and substantial financial, travel and productive-time savings for rural villagers. The consumer surplus gained through phone use demonstrates that the Village Phone is clearly a cost-effective tool for enabling rural people to take active roles in productive activities and life outside the village. Consumer surplus is a measure of how much a phone user gains by using a telephone rather than an alternative means of communication. In rural Bangladesh, the most common form of alternative communication is personal travel, and the costs associated with personal travel include transportation costs and the

opportunity costs associated with being absent from normal village labor activities.

4.3.9 West and Central Africa

ASAFE (Association pour le Soutien et l'Appui à la Femme Entrepreneur) was created in 1989 and has a strategic alliance with Networked Intelligence for Development (NID). The organization is based in Douala, Cameroon and offers women entrepreneurs who live and trade in Cameroon, Chad, Mali, Guinea and Benin various business services and support for their businesses. It has focused its attention on the needs of women entrepreneurs, through awareness raising, counseling, and the provision of specific business training programs. Over the last few years, ASAFE has been consistently applying new ICTs to all its functions and activities. The organization is a one-stop information area accessible to the public for general inquiries and information, a "cyber-hub" with its own web site, access to 30 computers and training rooms. ASAFE focuses on assimilating and adapting technology to meet the community's needs and give women ownership of both content and methodology. In turn, successful technology transfer is achieved through capacity building, needs identification, ongoing community evaluation, monitoring and control, local decision-making and strengthening of social capital, by offering e-commerce to women entrepreneurs.

4.3.10 Sri Lanka

The Kothmale Internet Community Radio offers ordinary people a gateway to the global knowledge society. It combines local radio by local people in local

languages with information and communication technology (ICT) applications in a wide range of social, economic and cultural areas. Using community radio as an interface between the community and the Internet helps raise awareness about the Internet among those who do not have access to computers and connectivity.

The Kothmale community radio is an efficient way to promote active and continuous community participation within small target areas. The Kothmale Radio browsing program and the Internet access facility have demonstrated the potential for overcoming language barriers to accessing information available on the Internet. Moreover, being a participatory radio program, radio browsing of the Internet has taken into account the desires of rural communities to assimilate knowledge collectively, in contrast to the prevailing mode of individual access to the Internet. This ensures that ICTs are genuinely enabling technologies for all members of the community. The Center has a full range of multimedia facilities, plus a computer for Internet browsing, email and office, library and learning applications. The Project also has a web site www.kothmale.net to develop a database with useful information for the rural community, provide a portal for the community broadcaster, and give a means of expression for the community to reach out the cyber community through web publishing.

4.3.11 Ethiopia

Healthinfo-Ethiopia is an institution that promotes ICT among health professionals as well as acquires and disseminates health-related information

about Ethiopia and Africa to Ethiopians and other African in the continent and the Diaspora. It organizes annual ICT conferences for health professionals which is increasing the number of healthnet members - a global communication network for health professionals connected to healthnet in Ethiopia increased by 60% in just 6 months, and it is bringing more and more health professionals in Ethiopia access to information on the Internet. The 'Ethiohealth' discussion forum www.ethiohealth.listbot.com aims at fighting HIV/AIDS and improving health care in the country by creating a forum for Ethiopian health professionals to get involved in health related activities and a network of professional health practitioners. The contents of this discussion group are becoming resources for the local print media leading to convergence of ICT and print media in the country.

4.4 Findings and Cases in Perspective

The cases are not in any way exhaustive, but are representative of the success stories in the developing countries with a keen eye of catching up with the rest of the world that fall within the 'developed' bracket. The findings can be synthesized in light of the prevailing and expected ICT access and utilization and also in reference to the development level of the country and the global initiatives that put a challenge on the policy and economic-political situation to institute changes.

4.4.1 Professional Ignorance

Refusal to work with farmers as equal partners is a long time weakness bedeviling the extension services. Most extension workers assume that formal

training is adequate to downplay the importance of traditional knowledge system. This has led to low adoption rates for technologies that are deemed to be useful during formulation. There is some level of arrogance exhibited especially in areas with low user demand like bee keeping where traditional techniques are preferred to modern techniques. Introduction of modern hives is resisted because the process of introduction is not persuasive but rather authoritative. One farmer, Edward Muli, confided that he has misgivings about using top bar hives because nobody bothered to show him how to harvest honey from them, and the harvesting suit promised to him was not delivered.

Ignorance or lack of respect for cultural values of farmers was discovered as a hindrance to adoption. Extension efforts have been frustrated by lack of understanding or appreciation of indigenous communication systems and indigenous customs. For example, use of women change agents in communities that still despise the idea of women leadership is ludicrous and considered irrational in the eyes of the concerned communities. Adequate understanding of the people with whom we work with is imperative if we have to make headways in extension campaigns.

4.4.2 Professional Backstopping

From a process point of view, the research provided an excellent opportunity for proposing further refining of the RRAs as a backdrop to undertaking the detailed KAPs as tools for accurate diagnosis of farmer problems. Backstopping provides an opportunity to interact with the farmers as well as subject matter specialists involved in extension campaigns. These forums

provide ample opportunities to exchange old and new ideas. In the figure below, a radio presenter is seen collecting views from, and passing ideas to farmers.

Figure 4: A broadcaster collecting programming views from farmers in Tajikistan, for incorporation in the subsequent radio programs.



Source: Wason (2002).

The development of effective intervention messages cannot be achieved in the absence of adequate interaction with the beneficiaries, as is the case in Kenya. Similar initiatives have to be undertaken.

4.4.3 Gender Discrimination

Those who don't own radio sets are clearly underdogs who may find it difficult or taxing when participating in common socio-political discourse. This research sought a methodology and a set of participatory communication techniques for a gender approach to agricultural projects in a rural setting

without ICT availability. The research found out how the extension profession could select from a variety of communication methods, traditional and modern, according to the needs of particular projects and farmers.

Men in households own radios and men control the maintenance and therefore their use. Men make decisions based on acquired information and women, who comprise of more than 80% of smallholder labor force, implement them, by providing much of the farm labor. Both genders listen to radio but it is the women who could derive more benefit in terms of applicable information if they were given a chance. Decision-making is influenced by the quality of gender relationships within the family and gender differences with respect to access to resources and access to the benefits derived from agricultural production. Agricultural decision-making by farm families is affected by the circumstances they find themselves in and by their current needs. Women are definitely the underdogs.

This research showed that women have specific information needs and may require different agricultural technologies. In order to develop appropriate agricultural technologies for rural women and their families, a participatory communication and extension methodology is required that incorporates both indigenous and scientific knowledge. The more culturally appropriate agricultural materials and their delivery are, the more readily they will be received.

Using a gender mainstreaming approach, the importance of both men and women in agriculture was affirmed. Rural women do not make farming decisions in isolation from all the other decisions that affect their family and their relationships. Therefore, the quality and nature of these relationships must be considered. Agricultural practices and messages are required that are easy for women to adopt and perform, culturally acceptable and presented in a format that is easy for women to understand.

4.4.4 The Dependence Fix

Makueni District has always benefited from donor-funded development projects. Most of the respondents were found to think that only donors could redeem them from their present situation. When prodded to suggest how electricity can be accessed, they gave an example of how World Vision was to finance electrification of Mbuvo health center and therefore they become incidental beneficiaries. This is fatalistic since it makes the poor remain perpetually in the vicious cycle. They think that they cannot control their own destiny and therefore must remain subservient. They think that only loans or grants can make them own or access the Internet and other ICT tools.

It is true that there is need for external funding to develop ICTs in poor countries. But the initiative and responsibility of developing rural areas and subsequently the nations of the 'south' falls within the ambit of policy-makers and the institutional mechanisms in place. It is not the responsibility of developed countries to shoulder the development needs of developing nations.

CHAPTER V

DISCUSSIONS AND RECOMMENDATIONS

In this chapter, a discussion of the findings will be done and recommendations given on ICTs and rural radio with emphasis being given to structural, policy and socio-cultural domains of technology formulation, dissemination and adoption. The recommendations cannot be exhaustive but are within the confines of the study context and scope.

5.1 Policy and Structural Flexibility

The development of adequate infrastructural capacity to cope with the increasing demand for ICT utilization is a sure way of improving information access to rural communities. This requires the full liberalization of the Vsat industry and the deployment of satellite technologies in rural areas. This development, as Peter Kariuki, the Chairman of the (CCK) Communication Commission of Kenya puts it, “will open up new opportunities in the global market for our farmers” (Daily Nation, 23/09/03). The Internet access will not work as effectively as broadcast messages. However, the mere access will complement the existing infrastructure and reinforce it to reduce weaknesses.

Most of the modern ICT gadgets require electricity in order to be of use. Availing electricity in rural areas is one of the means through which access to the Internet can be enhanced. The rural electrification program is a noble exercise that should be done without political prejudices experienced in past

planning periods. Access should be for all. The licensing of Vsats for uplink and downlink services is another important factor to access needed data for onward transmission to farmers. The current status in which a monopoly reigns is not healthy. The Telkom Kenya's controlled '*Jambonet*', the only gateway to the international superhighway is always a disappointment to regular Internet users. It is a constant reminder of the past legacy of exclusivity. However, with assurances from the CCK chairman, the future looks bright.

There is need for the development of an ICT policy that will act as a guideline in the industry. The policy should go hand in hand with the media policy since ICTs enhance the effectiveness of media in information gathering, processing, storage, and dissemination. Liberalization of the ICT industry and the subsequent increase in the access to the data banks that enhance productivity is a sure way of improving the productivity and competitiveness of citizens. Lessening policy restrictions lessens the burden of seeking services. As Tolstoy puts it "I sit on a man's back choking him and making him carry me and yet assure myself and others that I am sorry for him and wish to lighten his load by all possible means - except by getting off his back" (Carty and Smith, 1981).

In the past, full IT development was not given sufficient priority in national budgets. The recent announcement by the Minister for finance to the effect that import duty on IT components will be zero-rated is a good policy initiative

in support of the IT industry. What remains to be done is formulation of strategies for financing sustainability for the ICT in rural areas.

The social context and the emerging information culture of ICTs should be given higher priority than purely technical and commercial considerations. While the Internet is impacting on the commercial sector, there is a need for a parallel transformation in the concepts and practices of those institutions with responsibility in the public and non-profit sectors to reflect the new opportunities presented by ICTs.

Universal service obligations have mandated that licensees in local and international traffic and cell phone networks provide landlines to address rural and underserved communities. This has not been outlined locally as a policy requirement. However, *Safaricom* has introduced what they call community telephone booths in the major towns of Kenya. A similar strategy was however, adopted in South Africa and to some extent, Uganda.

5.2 Linguistic Simplicity

Development ICT strategies for rural areas should take into consideration differences in languages, culture, socio-economic conditions and rural infrastructure. There is also need to encourage other players and sectors to invest in the design of ICTs appropriate for use in rural areas. The Sapir-Whorf hypothesis is grounded on the fact that the languages used by different societies have great differences in structure. These differences make people

who use them to see, interpret and understand both the physical and social world differently.

The interactionism paradigm shows the relationship between the psychological organization of the individual processes of human communication and the organization of social systems. The conceptions people have about reality are socially constructed through a process of communication using shared language. The language used in radio broadcasts has a bearing on the reality created on a particular innovation and therefore on the ultimate adoption.

In the same vein, the extension personnel should access the Internet and translate the world of text to the world of speech in which the farmers are well accustomed to. Telephone and other ICT tools are easy to harness, but not the text and figure-based content in other media. There is need for incorporating local content and issues in the design and development of intervention software. This paper therefore calls for use of local or regional languages commonly accepted, and the use of personnel who effectively share linguistic and technological commonality with the farmers.

Apart from the telephone, the majority of information exchanged via ICTs, whether in text format or broadcast orally, takes place in the languages of developed countries. Steps must be taken to address the needs of other languages and cultures through longer-term vision to make all ICTs

accessible to all people. This will involve significant investment and support for local content (in broadcasting and the internet) and software design.

5.3 Technical, Economic and Political Empowerment

The Millennium Development Goals, reached at the Monterrey Conference in Mexico in 2002 include the reduction of poverty by 2015 and halve the proportion of people who were living on less than \$1 per day in 1990 (Stern, 2002). This World Bank and UNDP-supported initiative recognizes that poor people are citizens who contribute to defining society's collective objectives. In competitive markets, the poor and the weak are sidelined as services are paid for. Public services, like agricultural extension are however deemed 'free' and provided through the "long route" of accountability. In such a scenario, people influence policy makers and the policy makers influence service providers.

Given weaknesses in the "long route" of accountability, service outcomes can be improved through strengthening the short route – by increasing the clients' power over providers. Service consumers need to be empowered adequately through decentralization. However, no single recipe works. Empowering citizens to monitor and encourage, and if necessary, discipline providers, can be achieved by raising their voice in policy making. ICTs come in handy by providing the latest information on aspects that affect people's daily lives.

For intervention communication to be effective, local champions should be identified and brought into the process from the start. Policy makers should be aware of the likely opposition from leaders and the potentially 'flattening'

impact this will have on traditional bureaucracies and power structures, which will interrupt the required collaborative synergy.

Use of appropriate technology, and keeping it as simple as possible, with provision for technical backup, fosters ownership of the projects by rural users and ensures that the rural communities themselves can operate the systems. This promotes local sources of information and knowledge. Extension personnel and radio broadcasters can conduct Internet searches for information and then sift, interpret and translate the information into forms that are usable to the local communities.

Development of "cybercafes" and strategically placed Telecentres can enhance utilization of the Internet and therefore place the concerned communities in good stead to participate in the global development arena. At a small fee, or fully subsidised rates, community members can access useful information from the superhighway.

This research shows that most rural communities in Kenya are greatly disadvantaged in relation to the telecommunication infrastructure (including telephone lines and electricity supply). There are strong feelings that rural connectivity initiatives would require significant investments in infrastructure before rural areas could participate fully in the new information and communication technologies.

Innovative programs like ASIP (Agriculture Sector Investment Program), mooted in mid 1990s 'died' fast. This program was supposed to change the approaches, contents, contexts, create a demand driven framework and

redefine the ministerial core functions. The extension services were also to be semi-privatized. The program was meant to empower farmers and other disadvantaged stakeholders to have a say in the formulation of appropriate and localized extension campaigns. The program faced bureaucratic resistance because it gave farmers the ultimate say in service delivery, and therefore threatened the status quo. This shows that we are for innovations but against renewal!

Use of participatory approaches to identify community needs and priorities, including sensitivity to existing power relationships, ensuring access by all levels of the community, and assigning responsibilities to community members is a sure way of improving technology adoption. Proponents of the participatory rural communication appraisal (PRCA), argue that for communication to be effective, various issues have to be addressed;

- Learning how communities communicate on various issues and how they utilize their networks to attain information flow.
- Understanding the roles of individuals and socio-economic groups in the communication processes.
- Establishing how concerns and issues are identified and prioritized by the community in the communication processes and how such issues are turned into messages through coding and how the recipients decode the messages.
- Identifying the community channels of communication and appreciate the ranking systems and channel utilization.

- Learning to package information to meet community expectations in tandem with community perceptions and action plans.
- Learning how messages are presented in performances like skits, drama, song, puppetry, poetry, and rituals.

This paper proposes that for effective introduction and utilization of new ideas, structural and human resource changes must occur before embarking on redeeming the corporate image of an institution or a program. The power to determine the destiny of peasants and their security, including food security, should rest with the peasants themselves. This argument, however, has limited plausibility. The farmers' cooperative movement is in deep trouble due to the ceding of management authority by the government to elected representatives.

Empowerment through capacity building should precede any attempts by the government to hand over management authority to farmers or peasants. As much as bottom-up approach is desirable, the relevant authorities should retain the supervisory role over the affairs of these organizations to elicit accountability. Similarly, the information needs of various users should be identified in order to develop user-specific, locally sensitive content and applications. The role of the private sector and civil society is key in this identification process. Rural development institutions like CBOs should provide support at the local level for rural people to generate their own content and applications.

Capacity building can also be enhanced through education and training on the utilization of new digital media. It is disturbing to note that in Kenya's Ministry of Agriculture, only less than 2% of the 8,000 technical staff is information technology literate. This group is either based in Nairobi or scattered in the country, with no immediate assignments that can enable technology application in the access of and dissemination of information. There is need to tap the potential of this group to perform the service of 'mediation' in linking farmers to data bases and to realize adequate update of information in the Ministry's possession through global linkages.

Traditional leadership in communities may be ill equipped, and therefore feel inadequate, or lack the information to move forward with ICT, and those with the skills may only be interested in pursuing individualized efforts. Thus communities need access to appropriate leadership and leadership training to assist in pursuing technology-enabled opportunities as they emerge. Thus we should include a significant leadership training component, not as an afterthought or as an "add-on" but as an integral part of the system. The training should be directed to allow for the non-professional user to manage the system being introduced and operated.

5.4 Development of Incentive Systems

The persistent occurrence of famine in most parts of the country can be attributed to the laggards who don't do much to alleviate poverty and ensure self-sustainability in food security. Similarly, the poorest households are the ones with high birth rates, an indication that they have not been co-opted into the mainstream national 'culture' of manageable family sizes. Based on

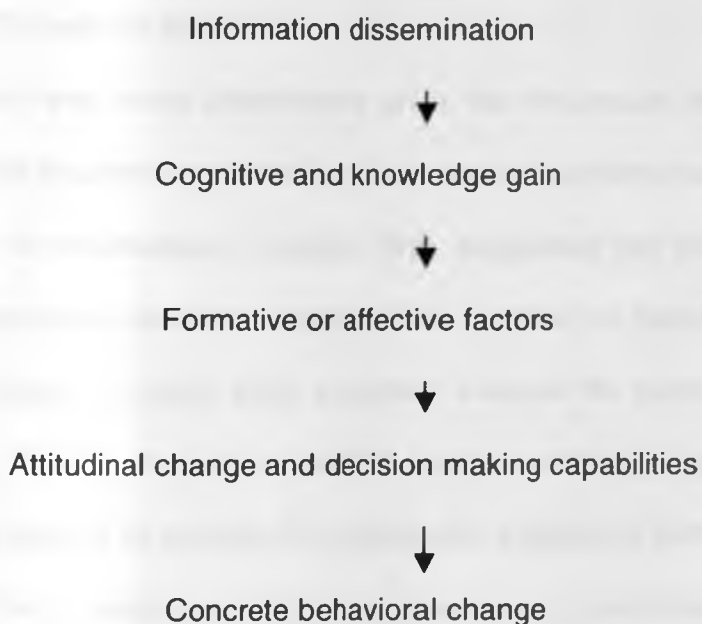
James Wilson's "*Broken Windows Theory*", 'if you tolerate hoodlums who break windows and litter streets with garbage today, you create an environment for more vicious crime tomorrow', the clients of agricultural extension should also develop their own reward and punishment system to deal with wayward service providers.

In the same vein, agricultural production should never be seen as a punishment. Early in individual development, the school system defines cultivation as a punishment by assigning offenders tasks related to digging, weeding and bush clearing. This tends to make the concerned youth develop negative attitudes early in life. This ingrained attitude is what makes it difficult for change agents to convince the youth that indulging in soil related activities is a worthwhile venture. The school system should therefore be reoriented to mould and develop citizens who are responsible and reliable. Career developers should define agricultural production as a profession and not a hobby, and move away from the subsistence culture to market-driven production.

5.5 Behavior Change Communication (BCC)

According to Hyman and Sheatsley, "even if all the physical barriers to communication were known and removed, there would remain many psychological barriers to the free flow of ideas". Interested people acquire more information than the uninterested people. People seek information and facts that are in tandem with their existing attitudes and different groups attach different interpretations to the same information. To achieve behavior change, there should exist a motivation in learning and assimilating new technology.

Extension programs seek to achieve certain behavioral changes in agricultural practices among farmers. When particular behaviors and practices are accepted, they result in action for social mobilization. The changes are coordinated and systematized by extension personnel to achieve desired results like food security. To induce behavior change, information goes through several stages;



Adoption cannot merely be achieved by increasing information flow; hence BCC cannot succeed unless baseline surveys are conducted to ascertain the existing knowledge, attitudes and the current practices and why they persist. This is a systems approach and is geared toward understanding the human behavioral aspects, such as socio-cultural, socio-psychological, and socio-economic factors which may facilitate or hinder adoption, or continued practice of recommended techniques by farmers. KAP surveys are a

prerequisite to interventions and enable change agents to approach issues from a point of advantage but without '*technology bias*' which occurs when change agents feel that the ideas they advance are superior than the ones they opt to displace. Well designed extension campaigns should incorporate BCC as a central pillar in the wider change paradigm. BCC should therefore be considered as a 'microcosm' of an effective extension campaign, with focus on long term change in attitudes and practices.

5.6 Taking Comedy to the Farm

Most farmers who were interviewed gave the impression that the radio programs that disseminate technology lack an entertainment component that is essential for attendance to media. They suggested that KBC and other radio stations should develop programs like *Tembea na Majira*, that have a comedy attribute to make them attractive avenues to purvey agricultural information. Similarly, they observed that popular comedy groups like *Vitimbi* should be engaged to provide the necessary impetus to technology-laden programs. The comedy groups perform skits during agricultural shows and their input should therefore be part of the broadcast culture.

Creating a theatre of epic drama of didactic documentary performance, loaded with agricultural messages, will create a genuine and indispensable medium through radio. "For technology to sell, it has to be buyable" (Bertolt, 1983).

5.7 Riding on Folk Media

Radio, being the most powerful invention after gunpowder, has a central role as purveyor of information. However, radio is purely an instrument of distribution; it just hands things out. Radio, and by extension other media, would have to give up being purveyors and organize audiences as purveyors.

Whatever radio undertakes it must endeavor to combat the inconsequentiality that makes nearly all our public services so laughable. We have an inconsequential extension system, which not only takes pain to have no consequences itself but goes to a great deal of trouble to smother traditional knowledge by picturing all objects and situations without their consequences. Farming, being a culture and therefore a way of life, we must develop our media to subscribe to the concept of '*development synergy*' through which issues related to agriculture and food security are given the prominence they deserve. A secure society in which communication approaches are empowering, culturally relevant and supportive of local indigenous knowledge is a good haven for media to grow.

However, our media houses subscribe to the concept of culture that considers that the development of culture is already finished and that culture does not require a continuous creative effort. No time is devoted to development issues. Political and inconsequential gibberish dominate airtime, providing decorative programs. The excluded media should therefore be confronted with an organization of the excluded. This will be directed towards ensuring that farmers are not only taught but that they also teach. The slightest move in

this direction will inevitably have a natural success that would far exceed the success of all past programs.

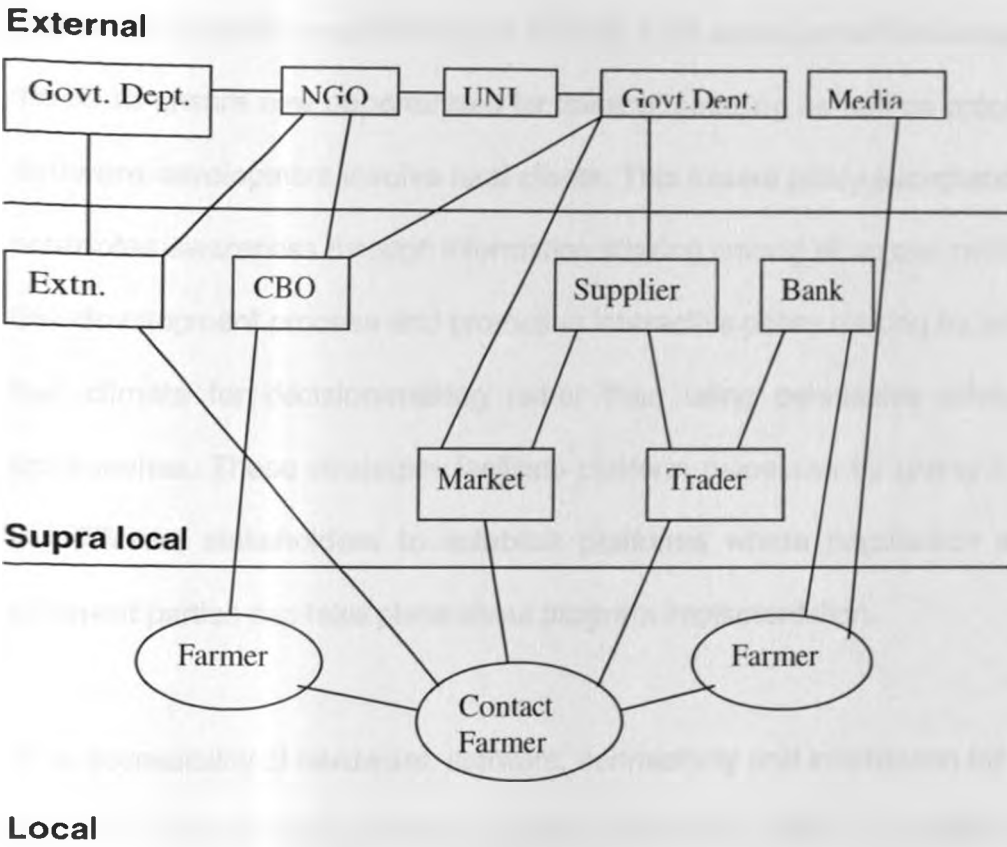
In this respect therefore, there is need to develop a radio station committed to the provision of development programs and complemented by a development website. This paper proposes the registration, development, and inauguration of Kilimo FM and www.kilimo.com. Already, the Ministry of Agriculture has the necessary basic infrastructure to build from. The Agricultural Information Center, a resource Division within the ministry is at the forefront of information documentation and dissemination. However not much can be achieved if its operations continue to based on obsolete methodology, concepts and software. *Revamping* is the word to describe the required action for the institution to mature into the information age and meet the expectations of the consumers, the implementers, and the financiers.

5.8 Building Linkages

A single entity or institution cannot effectively execute modern communication geared toward change. There are so many players that need to be involved in the programs. These include non-governmental organizations (NGOs), community based organizations (CBOs), religious groups, government departments and the donors. The linkages create complementarities that are important in enhancing persuasion reinforcement and evocation of community dynamics hence ensuring faster adoption of innovations. Linkages can be both vertical and horizontal. Horizontal linkages are enhanced through collaboration of concerned institutions in areas of common convergence.

Vertical linkages are enhanced through connecting rural communities to centers of power or to policy makers.

Figure 5: Information Linkages in Rural Systems.



Source: Own modification from several studies, 2003.

Ensuring that there is active community participation in the design and management of networks reduces the chances of program failures. There is need to examine existing connectivity and examining the possibilities of coordination and sharing of facilities with a variety of users to reduce costs, risks and duplication, taking into account the high failure rate of single-purpose systems. Consideration should be given to utilizing existing Internet

and e-mail service providers rather than building new networks in cases where the costs are prohibitive or where interconnectivity is synergistic.

The private sector should be encouraged to extend its current involvement in technical utilization and training for ICTs to rural areas and efforts should be made to ensure new opportunities for training, sourcing as well as proprietary software development involve rural clients. This fosters policy acceptance and promotes awareness through information sharing among all actors involved in the development process and promoting interactive policy making by creating the climate for decision-making rather than using persuasive advertising approaches. These strategies facilitate platform processes by giving a voice to different stakeholders to establish platforms where negotiation among different parties can take place about program implementation.

The accessibility of hardware, software, connectivity and information for users to which the technology is being applied, particularly within the context of the user's physical community is important in building linkages incorporating the user and his community into the system design process and introducing new elements and new "stakeholders" into an extended approach to ICT design, development, and implementation. This approach is called *community informatics* and deals with issues of access and use of information sources. Individuals provide information, comfort and mutual assurance to each other through the medium of the Internet. This can be done either by e-mail, news groups or web conference (asynchronous) or by chat (synchronous). Included in this would be a variety of groups of producers working in similar geo-

political areas, for example the URTNA program exchange to enhance African content capacity and utilization.

Building upon the linkages with stakeholders established before and during extension campaigns provide the technical resource base to tackle each set of problems areas in logical progression. Local content and expert systems developed in different countries could also be shared through an electronic agricultural network over the Internet. New initiatives should avoid fragmentation and duplication of costly infrastructure against the challenge of an ever-diminishing resource base and projects developed should respond to needs of small-scale farmers and entrepreneurs. There should also be more consultation and active involvement of private sector and civil society organizations that produce and use knowledge and information.

To achieve an *information renaissance* in Kenya and ensure universal access, the information systems established should be multi-sectoral and use a mix of appropriate traditional media and new ICTs depending on preferences of the users. All relevant stakeholders should facilitate the evolution of appropriate ICT policies in Kenya and work towards a common goal of ensuring rural development and food security. Where the infrastructure is not yet developed, the Internet could be used from a central point (telecentre) for online broadcasting and for exchanging relevant information from other countries and regions. The telecentres will also provide a stage for rural communities to address their training and development needs and vision.

5.9 Paradigm Shift

There is need for shift in paradigm from *development communication* to *community communication*. The former concept was in vogue in the decades of the 1970s and 1980s and emphasized on the centrality of information provision as a way of catalyzing development in developing countries. However, the ideology failed the test of time as it was realized that information bombardment alone couldn't emancipate the 'poor' to catch up with the 'rich'. There was need to explore socio-cultural orientation of the recipients. Community communication was mooted as a way of involving beneficiaries in the design of intervention messages. This was the beginning of participatory rural appraisal, planning and implementation. The concerned communities are prodded to realize that they have needs that a donor can fund. The donor then insists on strict implementation time frames and no midstream changes are expected as budgets are fixed. The exit period is the most haphazard since no gradual weaning is factored into the overall scheme. Sustainability is thrown into disarray.

However, the approach is fraught with many limitations. The communities should be allowed to identify their own felt needs, develop proposals, and factor in monitoring frameworks and post-donor implementation. Most projects in ASAL areas fail due to lack of genuine concern for the welfare of the recipients. This is what Robert Chambers calls '*Development Tourism*'. To avoid such mistakes it is imperative that all stakeholders are involved in all the stages of program development and access to other successful programs allowed so that beneficiaries exchange experiences. The new ICT like

Internet, come in handy as an inexpensive way of achieving this. In this context, community broadcasting represents participatory communication with the potential for feedback and in the process creates a means to achieve change and holistic community development. There is development of dialogue between the change agents and the audiences. The change agents act as facilitators of learning, by evoking and provoking the expression of what the audience know. Toward the end, the facilitators can then modify, add and summarize the expression of farmers' experiences.

5.10 Source and Channel Credibility

Attempts should be made to ensure that credible media are used to disseminate information that carries adoption messages. A radio school cannot be fully participatory unlike a farmer field school. An attempt can be made to increase the frequency of on-air interaction. In order to be efficient and effective, the radio school should be issue-based. That is, it should avoid indulging in too many non-core functions and instead develop an editorial policy that will distinguish it from the other media houses. It should also be evocative and provocative to initiate dialogue and feedback that is essential for subsequent programming. The programs should be facilitative and catalytic i.e. move the audience a step from the point of convergence onto a better status or a more gratifying lifestyle.

Credibility is also enhanced through neutrality and widespread legitimacy of the technology and information being disseminated. Biases due to religion, politics, patents, and conditionalities may lead to low diffusion and adoption.

The continued reliability and scientific validity of information is one of the ways of ensuring high rates of adoption.

Media credibility is an important component in the adoption process. The conveyors and purveyors of information should strive to develop rapport with the program beneficiaries. This is especially critical in addressing the concerns of the old, in the health programs and issues that bring the aspects of social life into the fore.

5.11 Beyond Participation

Extension messages are ideally designed for ideal farming situations. However, in the presence of a large pool of laggards, there arises a problem of slow adoption and a need for more resources and time. Extension per se “extends” the whole gamut of recommended information package. The Ministry of Agriculture has extension manuals and guidelines that outline the content of the campaign messages. However, the guidelines lack, in a big way the context and the media to use in reaching the target audiences. This limitation is what makes extension personnel apply umbrella recommendations without selecting, prioritizing and utilizing the best mix of ideas to reach and ‘massage’ the conviction of farmers.

An estimated US\$ 6 billion a year is spent on some 600,000-extension workers engaged worldwide. Of these, 8,000 are in Kenya, representing about 1.3% of the global total. This is a big proportion in a Third World economy. The world population projections are focusing at a growth from 5.7b in 1995,

6b in 2000, 8b in 2025 and 9.8b in 2050. There is therefore a need to develop an equivalent of the 'Green Revolution' that enabled the world to produce enough food to feed itself in the decades of the 60s and the 70s. This need should be coupled with extension programs that are of quality and relevance and to reach the large proportion of farmers currently not reached by the services.

Personnel in arid areas require guidelines different from those in use in high potential areas. This is because the type of enterprises, the environment, and the socio-cultural and econo-political nature of inhabitants are radically different. Participation is therefore not a remedy in persuading farmers to adopt technology meant for other areas. In other countries like Egypt and India, there is a presence of social anthropologist in the extension divisions to cater for the social dynamism that may hinder adoption. There is need to internalize the fact that before embarking on introducing an innovation, we must gradually destroy the social fabric that support the technology that we intend to replace and build a system that will support the new innovation at the same rate. This can be done through explaining biophysical information increasingly with the aim of creating new perspectives rather than transferring pre-packaged solutions. This makes things 'visible' to the recipients of new innovations.

CHAPTER VI

CONCLUSION AND WAY FORWARD

The least expensive input for rural development is knowledge. Knowledge and information are basic ingredients of food security and are essential for facilitating rural development and bringing about social and economic change. Traditional media have been used very successfully in developing countries, and rural radio in particular has played a major role in delivering agricultural messages. Print, video, television, films, slides, pictures, drama, dance, folklore, group discussions, meetings, exhibitions and demonstrations have also been used to speed up the flow of information. New ICTs, however, have the potential of getting vast amounts of information to rural populations in a more timely, comprehensive and cost-effective manner, and could be used together with traditional media.

Ideas like the DOTForce are good for addressing global media imbalance. However, behind this idea is lurking a veritable network of sub-idea, sub-confusions, and sub-myths, of more or less importance. This is because the idea is perceived to be pushed by the G8 industrialized countries. Amazon.com's founder and chief executive officer, Jeff Bezos, at the "Creating Digital Dividends" conference in Seattle, USA, October, 2000, "emphasised that developing regions could leapfrog traditional development by skipping entire layers of ICT infrastructure" (*Business Week*, Dec. 18, 2000). Developing countries will be left behind if they do not fully participate in the global information and knowledge system, or as the 1996 World Bank report (*Increasing Internet Connectivity in Sub-Saharan Africa*) put it, "will be crushed by it".

There is need to harness the new ICTs in order to improve the operational tasks of technology dissemination. The Internet is doing a lot in the areas of multi-media integration. It is streaming audio and visual as major delivery vehicles. These, together with satellites are making the entire idea of digital communication a reality unthinkable a few years ago. ICTs have been used to

enable, strengthen or replace existing information systems and networks. Electronic mail is the most commonly used new ICT and has caused a cultural revolution in the way individuals and organizations interact, in terms of time, cost and distance. These modern technologies offer new and multiple perspectives, such as faster and better-focused access to information.

There is also need to develop content and media through incorporation of the socio-cultural, economic, demographic, geographic, and linguistic context and characteristics of the local communities to who communication programs are targeted.

From the research, it has been proved that ICTs alone cannot offer the required remedy that the development of Kenya and other lower countries need to leapfrog through the stages of development. What is desired is socially and culturally responsible connectivity by not only providing access, but by fostering equitable access and community empowerment through use of the ICTs, through adequate local technological appropriation in the expression, gathering, dissemination, accumulation, analysis, and sharing of information and knowledge.

Popular culture is meant to satisfy popular cravings. Agricultural messages do not subscribe to the ideals of popular culture, which promotes consumerism. It might be argued that, in a world dominated with the content of the advanced countries, the less connected, and therefore less exposed are protected from the excesses of the conglomerates, their propaganda, and their pornography. Commercial stations rely on advertising revenue, which is easier to obtain from urban areas where it is perceived the listeners have higher spending power. Non-profit radio services urgently require training in to improve programming quality.

Extension networks provide access to the much needed knowledge, technology and services. Studies on information systems serving rural communities have focused on specific sectors such as agriculture or health, instead of covering the rural community needs in a holistic manner. This is

why some programs like the top-heavy SIDA-funded "catchments approach" program do not achieve much of what they are meant to achieve because they focus only on narrow aspects, like soil conservation. Rural information systems must involve rural communities and local content must be of prime importance.

Way Forward

To some degree, looking to ICT as a solution to the economic problems of rural and remote areas may be wishful thinking. It is not evident how ICT will be of immediate benefit to most individuals or communities, particularly those without direct access to the hardware and the skill and education level required to make some effective use of it. On the other hand, ICT and particularly the Internet are offering benefits and opportunities to some-enhanced marketing of tourism operations and specialized products such as crafts or foodstuffs. But these examples are for the moment, anecdotal and highly particular.

There are more than 800 million radio sets in use in developing countries. An average of one in ten people have radios. There is a large unmet demand for radio broadcasting. These applications are selective and primarily for those few who already have access to the technology and to the capacity to use it. However, the overall effect is to raise the level of the local infrastructure to a point of being able to develop the Internet backbone for use in other ICT areas.

With food requirements in the developing world expected to double by the middle of this century, both agricultural production and investment in agriculture will need to increase. This includes investments in technology development and on-farm improvements and in rural infrastructure. It also includes increased investment in knowledge, education, information and skills training, in short, in human resource development. Furthermore, institutional changes in research, extension and education will be necessary in order for farmers to take full advantage of a second green revolution. A major challenge is how to combine the experiences and insights of farmers with the

knowledge, information and skills generated by researchers, extension workers and agricultural educators.

The changes brought on by the first green revolution in the 1960s and 1970s have been essential for allowing food production to surpass population growth over the past fifty years. While it is projected that agricultural production will grow faster than world population over the next coming decades, the margin will continue to shrink. Furthermore, most of the projected gains in production will need to come from more intensive agriculture and increased productivity, rather than from farming new lands. This means that a new, second-generation green revolution is needed. This second green revolution has knowledge, information and skill requirements that are different from those of the first green revolution.

In June 2000, the Kenya Agricultural Research Institute (KARI) launched the agricultural technology and information response initiative (ATIRI) to empower farmers to make technological and information demands from KARI and other service providers and to ensure that the latter respond to the demands so as to promote up-scaling of technology adoption through strengthening partnerships and ensure that farmers' needs are integrated into the research and extension agenda. This well-intentioned initiative will bridge the gaps that exist between the service provider and the farmers who are the ultimate agricultural technology consumers.

In the same year, FAO and The World Bank produced a publication titled *Agricultural knowledge and information systems for rural development (AKIS/RD): Strategic vision and guiding principles*. This publication emphasizes the necessity for an integral approach to research and extension in order to accomplish growth of agricultural production in a sustainable way. The system should promote mutual learning, generate, transfer and utilize agricultural information, knowledge and technology and integrate all stakeholders in this process. The publication states that AKIS/RD needs to be more sustainable as a whole, more effective, more responsive and accountable, and better involve a variety of stakeholders.

Developments in the agricultural sector and the development of the global economy as a knowledge economy require the involvement of all stakeholders, including the private sector. New partnerships and the new division of responsibilities in AKIS have to be considered. There should be studies to assess the policy implications of the public and private sector roles in research and extension and how changes in the public-private interplay affect the performance of the agricultural knowledge system as a whole.

The United Nations, through UNESCO, has launched a “knowledge society” initiative. Between October 9-10, the UNESCO Director General hosted a Ministerial Round Table “Towards knowledge Societies”, on the 32nd session of the General Conference in Paris, with the objective of discussing cultural and linguistic diversity, access to education, equitable information society, and freedom of expression. The meeting also formed part and parcel of the process culminating in the World Summit on the Information Society (WSIS), to be held in Geneva, Switzerland, in December 2003 and Tunisia in 2005.

In the joint communiqué, the ministers adopted many aspects, including;

- Improving the lives of citizens in member countries through building of knowledge societies to adapt to globalization.
- Equip societies with capacity to identify, produce, process, transform, disseminate and use information to build and apply knowledge for human development through empowering social vision encompassing plurality, inclusion, solidarity and participation.
- Universal access to information, through building of relevant ICT infrastructure.
- Address issues of digital divide to improve digital opportunity through digital solidarity.
- Identify, digitalize and mainstream indigenous knowledge.

The Kenyan delegation was composed of Fred Gumo (Asst. Minister, Tourism and Information), George Opiyo (Director of Information), and Shem Ochuodho as a delegate.

Creating a knowledge society means that we begin to learn for the future, that we start making decisions today to cause a future to happen where poverty and hunger are things of the past. It is possible to develop a system of technology-based information exchange for rural families to connect to the larger external world in new ways they can derive benefit. Establishing Telecentres that can be used as information hubs that capture, repackage and disseminate information to rural communities. A development strategy should be formulated that focuses on rural and agricultural communities and the intermediary agencies that serve those communities with advice, financial support, research, extension, and training.

In oral cultures, the collective memory and importance placed on the local networks to store and retrieve information creates a strong system for information flow. There is a need for mediation between the traditional and emerging information systems when considering the socio-cultural and economic leap that will be required for societies, accustomed to receiving information orally from a known and trusted source, to new digital, text based information from virtual, and virtually anonymous, sources. This effectively bypasses the position of elders as knowledge brokers within the villages. When confronted with a competitive information source, one that they have not yet mastered, the natural reaction is to discourage and discredit the information. This compounds the problem of laggards.

Introducing and using the potentially powerful delivery medium, the national radio system as a stimulus for local development, is important while using extension staff to host the schools on the air, and in effect their status as reliable sources is considerably enhanced as a result. At the moment, technical persons are not used in the development and dissemination of radio-based agricultural programs.

Thus, as a learning experience communication approaches have to be empowering, culturally relevant and supportive of indigenous knowledge. Using various media, the goal of various programs should be to develop a

participatory communication model that would deliver appropriately designed technologies to rural farmers.

Finally, this study was not in any way exhaustive. There is need for the development and financing of more research to meet the overall development objectives of the less developed regions that need these technologies most to bridge the digital divide characterising the development disparities on the local, national, and global arena.

Appendix I

Research Resources and Budget

Below is a breakdown of the anticipated cost:

1. Laptop hire, 4 months @5000	Ksh. 20,000.00*
2. Stationery, Typing & Printing	Ksh. 100,000.00*
3. Research expenses- Internet	Ksh. 50,000.00*
4. Field and administrative expenses (approx)	Ksh. 118,000.00*
(i) Research assistants 2x 40 days@ 200	Ksh. 16,000.00
(ii) Accommodation 40 days@ 1800	Ksh. 72,000.00
(iii) Transport (approx)	Ksh. 10,000.00
(iv) Stakeholder copies	Ksh. 20,000.00
TOTAL	<u>Ksh. 288,000.00</u>
Contingency (10 %)	Ksh <u>30,000.00</u>
GRAND TOTAL	= <u>Ksh 318,000.00</u>

* Item totals

Appendix II

Farmer Sample Questionnaire

1. Name...
2. Location...
3. (i) age.....(ii) Sex...(iii) Occupation...
4. Literacy level...
5. a) Annual income level and sources (i) On-farm..... (ii) Off-farm...

b) Proportion of on-farm income

c) Proportion of off-farm income
6. Type(s) of enterprise(s)/ husbandry practice(s) involved in.
7. a) Have you attended any agricultural training course?

b) If so, which (i) Formal (ii) Baraza (iii) Radio (iv) TV (v) Field-day
8. (i) How frequently do you attend to radio broadcasts?

(ii) On what aspects?

(iii) How much do you value the broadcast ideas?

(iv) Have you been involved in radio call-ins?
9. According to you, which is the best channel for technical communication?

(i) Print (ii) Interpersonal (iii) Audio-visual (iv) Visual (v) Audio

10.(a) Which are your favourite programs?

(b) What are the benefits accrued from the programs?

(c) Give reason(s) for your answer...

11. (a) Have any persons visited you with agricultural information for your consumption?

(b) Has anyone asked you to give opinions on how to improve extension services?

(c) Is there evidence that your suggestions are incorporated in subsequent programs or extension cycle?

12. Do you have different ways of doing things besides the information gotten from others?

13. Which of the two practices yield better results?

14. What are some of the factors that make you less inclined to adopt new techniques?

15. What are some of the factors that make you more inclined to adopt new and discard old techniques?

16. What do you think can/should be done differently?

Appendix III

Professional Sample Questionnaire

1. Name...
2. (i) Age..... (ii) Sex... (iii) Position...
3. Organization...
4. Working area...
5. Duration in service...
6. Kind of extension services offered
7. Strengths of the approaches in use
8. Weaknesses inherent in the approaches
9. Expected impacts
10. Actual impacts
11. Who takes responsibility for success or failure?
12. What are the remedial measures that can be taken to correct the situation?
13. What has already been done to correct the situation?
14. a) Are there obstacles encountered in the process of correction/ adjustment
(i) Yes (i) No

b) If so, which?

15. a) Do you consult with other stakeholders like farmers before formulating and implementing extension programs?

b) If so, what is their level of involvement?

16. a) Do you apply the same approaches uniformly across the various units with different geographical and demographic characteristics?

b) Explain your answer...

17. Besides the institutional contents and approaches, do you have your personal input and observations on the existing guidelines?

18. Which channels do your institution use (i) Audio..... (ii) Visual..... (iii) Print..... (iv) Others.....

19. Which is the most useful channel (ranking) to use in disseminating farming messages in terms of;

(a) Cost effectiveness

(b) Convenience

(c) Ethics

(d) Inclusivity

(e) Impact

20. What is the gender proportion in terms of attendance to various channels?

(a) Radio (i) Male..... (ii) Female.....

(b) TV (i) Male..... (ii) Female.....

(c) Press (i) Male..... (ii) Female.....

(d) Others (i) Male..... (ii) Female.....

21. If you were a farmer would you be happy with the services on offer?

22. Besides the extension manual, are there other sources of guidelines to your work?

23. a) Apart from your formal training, have you attended/do you attend refresher course(s) ?

b) If so, who financed/s it/them?

c) Duration of the course(s)

24. Who influenced your choice of career (i) Self (ii) Career Master (iii) Parents (iv) Peers (v) Only option available?

25. a) Are you motivated to do the kind of work you are doing?

b) What motivates/ de-motivates you?

26. (a) Have you obtained information from the Internet for onward transmission to farmers (i) Yes (ii) No

(b) If yes, which sites are most popular to you?

(c) If no, why haven't you incorporated Internet as an important source of information?

(d) Do farmers seek agricultural information without your prompting or priming?

Appendix IV

Checklist

1. Are the radio programs community driven?
2. Are the programs and presenters innovative?
3. Are the programs aired at times when they can have maximum impact?
4. Are the delivered messages sustainable if put into practice?
5. Are the technologies being disseminated transferable within the social system?
6. Are the programs geared toward gender and youth mainstreaming?
7. Do the programs have a training component?

Appendix V

Bibliography

1. Accasina, G., (2000), *Information Technology and Poverty Alleviation*, Rome: FAO.
2. Acunzo, M. (2001), *Communication for Natural Resource Management in the Syrian Steppe*, Rome: FAO.
3. Adhikarya, R. (1998), *Strategic Extension Campaigns*, Rome: FAO.
4. Allport, W.A. and Postman, L. (1947), *The Psychology of Rumour*, New York: Holt.
5. Balaji, V. et al (2000), *Towards a Knowledge System for Sustainable Food Security: The Information Village Experiment in Pondicherry*, Bangalore: National Institute of Advanced Studies.
6. Benor, D. and Baxter, M., (1984), *Training and Visit Extension*, Washington: World Bank.
7. Bertolt, B. (1983), *Radio as a Means of Communication*. In Mattelart, A. and Siegelau, S. (Eds.), *Communication and Class Struggle*, New York: International General.
8. Blum, A. (1996), *Teaching and Learning in Agriculture: A Guide for Agricultural Educators*, Rome: FAO.
9. Carine, R. (2002), *Rural Radio and Food Security*, Rome: FAO.
10. Carthy, R. and Smith, V. (1981), *Perpetuating Poverty: The Political Economy of Canadian Foreign Aid*, Ontario: Between the Lines.
11. Chambers, R. (1992), *Rural Development: Putting the Last First*, University of Sussex: Institute of Development Studies.
12. Coldevin, G. (2001), *Participatory Communication and Adult Learning for Rural Development*, Rome: FAO.
13. *Community Media and the Ideology of Participation* (1977), Quebec: Council for the Development of Communication.
14. Crowder, L. V. et al, (1998), *Knowledge and Information for Food Security in Africa: from Traditional Media to the Internet*, Rome: FAO.
15. Crowder, L.V. (1998), *Learning for the Future: Human Resource Development to Reduce Poverty and Achieve Food Security*, Rome: FAO.
16. Ernberg, J. (1998), *Empowering Communities in the Information Society: An International Perspective*, Rome: FAO.
17. FAO FarmNet Brochure (2000), Rome: FAO.
18. Fortier, F., (1999), *Rebooting the Net: Towards Alternative Strategies for Information and Communication Technologies in the Context of ICPD Advocacy*, International Seminar on ICPD Advocacy in the Global Information and Knowledge Management Age, UNFPA Technical Report No. 47, 1999).
19. Gavia, L. (1996), *a Farmer-First Approach to Agricultural Communication: A Case Study From the Philippines*, Rome: FAO.
20. Gerbner, G. and Siefert, M., (Eds, 1984), *World Communication: A Handbook*, New York: Longman.
21. Gerschenkron, A. (1962), *Economic Backwardness in Historical Perspective: a Book of Essays*, Cambridge: Harvard University Press.

22. Girard, B., (2001) *"The Challenges of ICTs and Rural Radio"*, Keynote paper at the FAO First International Workshop on Farm Radio Broadcasting *ICTs Servicing Farm Radio: New Contents, New Partnerships*, Rome, February 2001.
23. *Guidelines for the Planning, Conduct, and Evaluation of the Multi-media IEC Field Campaigns*, Rome: FAO.
24. Gurstein, (2000), *E-commerce and Community Economic Development: Enemy or Ally?* Rome: FAO.
25. Hahn, H. P., (1997), *How Much Advice Do Resource –Conserving Farmers in West Africa Need: a Case Study of the Kassena in Burkina Faso*, Frankfurt: German Technical Cooperation.
26. Hamelink, C. (1994), *Trends in World Communication: On Disempowerment and Self-Empowerment*, Penang: Southbound.
27. Hamelink, C.J. (1980), *Cultural Autonomy in Global Communication*, London: Centre for the Study of Communication.
28. Hammond, A., (2001), *Foreign Affairs*, March/April Issue.
29. Ilboudo, J.P. (2002), *Rural Radio as a Social Enquiry Tool*, Rome: FAO.
30. Jahn, A., (1998), *Food, Agriculture and Forestry in the Federal Republic of Germany*, Bonn: Evaluation and Information Services.
31. Katz, E. and Lazarsfeld, P. (1955), *Personal Influence*, Glencoe: The Free Press.
32. Klapper, J. (1960), *The Effects of The Mass Media*, Glencoe: The Free Press.
33. Landes, D. (1998), *The Wealth and Poverty of Nations*, London: Little Brown and Co.
34. LaRose, R. and Straubheer, J. (2002), *Media Now*, Belmont: Thomson Learning.
35. Lerner, D. (1958), *The Passing of Traditional Society*, New York: The Free Press.
36. Levin J., (2002), *Guide for Writing a Funding Proposal*, East Lansing: Michigan State University Press.
37. Linda, M. (2001), *The Global Infrastructure: Empowerment or Imperialism?* In *Third World Quarterly*, Vol.22 No.1.
38. Lucas, F.B., (1999), *Rural Radio in the Philippines*, Rome: FAO.
39. Mattelart, A, and Siegelau, S. (Eds, 1983), *Communication and Class Struggle*, Vol. II: Liberation, Socialism, New York: International General.
40. Mbindyo, J., (1981), *Diffusion of Solar Technology in Southern California*, Stanford: (Unpublished PhD Dissertation).
41. Mbindyo, J., (1991), *Diffusion of Innovation: A Theoretical Framework and its Implication for Family Planning*, Nairobi: UNFPA.
42. McConell, S., (1998), *Connecting With The Unconnected*, Rome: FAO.
43. Mugenda, O.M. and Mugenda, A.G. (1999), *Research Methods: Quantitative and Qualitative Approaches*, Nairobi: ACTS.
44. Munyua, H. (2000), *ICTs for Rural Development and Food Security: Lessons from Field Experiences in Developing Countries*, Nairobi: CAB International.
45. O'Farrell, C. (2001), *Personal Communication*, Rome: FAO.
46. Okigbo, C. (1999), *Media and Sustainable Development*, Nairobi: ACCE.

47. Protz, M. (1998), *Developing Sustainable Agricultural Technologies With Rural Women in Jamaica: A Participatory Media Approach*, University of Reading: Agricultural Extension and Rural Development Department.
48. Rakotoson, J.P. (2002), *Rural Radio and Development*, Rome: FAO.
49. Ricardo, L. et al, (1997), *Agro forestry Today*, Nairobi: ICRAF.
50. Richardson, D. (1999), *The Internet and Agricultural Development*, Rome: FAO.
51. Richardson, D., contribution to the *FAO e-forum*, "The Appropriation of Traditional and New Media for Development: Whose Reality Counts", December 2001, Rome: FAO.
52. Rogers, E. (1976), *Communication and Development: The Passing of a Dominant Paradigm*. In Rogers, E.(Ed), *Communication and Development: Critical Perspectives*, Beverly Hills: SAGE.
53. Rogers, E. and Shoemaker, F. (1971), *Communications of Innovations, A Cross Cultural Approach*, New York: The Free Press.
54. Sabine, I.M. (2001), *Discovering "The Magic Box": Local Appropriation of ICTs*, Rome: FAO.
55. Shaw, D.L. and Mc Combs, M.E. (1977), *The Emergence of American Political Issues: The Agenda-Setting Function of the Press*, Minnesota: West Publishing Company.
56. Shearon, L.and DeFleur, M. (1988), *Milestones in Mass Communication Research: Media Effects*, New York: Longman.
57. Stichele, P.V.D. (2000), *Folk and Traditional Media for Rural Development*, Rome: FAO.
58. Stichele, P.V.D. (1997), *Promoting Food Security Through Rural Connectivity and the Internet*, Rome: FAO.
59. Truelove, W. (1998), *The Selection of Media for Distance Education in Agriculture*, Rome: FAO.
60. Tudesq, A.J. (2002), *Africa Speaks, Africa Listens*, Rome: FAO.
61. Turban, E. et al, (2000), *Electronic Commerce: a Managerial Perspective*, New York: Prentice Hall.
62. UNESCO (2001), *Integrating Modern and Traditional Information and Communication Technologies for Community Development*. Seminar Report, Kathmale (Sri Lanka), January 21-27.
63. Van den Berg, M.H.(2001), *The Agricultural Knowledge Infrastructure: Public or Private?* Rome: FAO.
64. Visinoni, A. (2002), *Introduction to Participatory Communication for Sustainable Development*, Rome: FAO.
65. Wason, A., (2002), *Farmer-to-Farmer: A Participatory Radio Series for Private farmers in Tajikistan*, Rome: FAO.

Appendix VI

Profile of Implementer

Emmanuel Mokoro, an M.A. student at the School of Journalism, undertook implementation of the project. Mokoro obtained a BSc. (Hons.) in Agriculture from Egerton University in 1995, and has worked in agricultural extension for six years. During that period, he witnessed glaring weaknesses in extension campaign processes and has embarked on attempts to remedy the situation. This thesis highlights the beginning of that long journey. He was supervised by Magayu Magayu, a lecturer at the School of Journalism, University of Nairobi.