THE USE OF THE INTERNET

IN THE DEVELOPING COUNTRIES FARM RADIO NETWORK

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ABSTRACT

THE USE OF THE INTERNET IN THE DEVELOPING COUNTRIES FARM RADIO NETWORK

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The Developing Countries Farm Radio Network (DCFRN) is a non-profit Canadian organization with an international member base. Its purpose is to find simple techniques that farm families and rural communities can use to increase food supplies and improve nutrition and health; and to distribute information on these techniques to rural communicators in developing countries.

The goal of the study was to examine the current and potential use of the Internet to provide and exchange information and create an on-line network in DCFRN.

Data were gathered through an on-line survey; an on-line discussion group; personal interviews in Honduras; and informal interviews with staff of DCFRN. The data analysis included both quantitative and qualitative methods.

The largest number of respondents perceived the Internet as primarily an information provider and secondarily as a networking instrument. The most common concern of respondents was the lack of funds for connectivity and access to the resources it offered. The main incentives to use the Internet were the opportunity to exchange information and communicate with other DCFRN members.

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INTRODUCTION

Preamble on Information Telecommunication

Telecommunication technologies and services are a large part of the information age and have implications for those located in rural areas (Black, 1986). If infrastructure is in place, then rural areas should not be isolated from the wealth of information and exchange of information that the Internet could provide. However, when exploring the use of technology, it is important to be aware of the difference between a solution to a problem and a solution in search of a problem (Black, 1986). A solution to a problem indicates the existence of an actual problem. A solution in search of problem suggests that technology simply wants to be applied to a given situation regardless of its necessity or potential solution.

To effectively use telecommunication for development, it is important to focus on bridging the technical and social dimensions when planning, implementing, using and evaluating policies or programs. Participation and ownership of stakeholders at the beginning of an initiative could provide an opportunity to reach a development goal and may guarantee the appropriate development and use of technology. Telecommunication as a tool for development is not about the technology or information but about people and their ability to share knowledge with one another (Smolan, 1996).

Developing Countries Farm Radio Network

George Atkins, a former CBC farm broadcaster, established the Developing Countries Farm Radio Network (DCFRN) in 1979. His aim was to help poor farmers in developing countries by learning from farmers in one place and sharing that knowledge with farmers located elsewhere. The organization has two main goals. First, it seeks to

help, "farmers in the poorest parts of the world help themselves to build better lives for their families. A secondary goal is to help community broadcasters so that [the broadcasters] foster self-help at the community as well as individual levels" (DCFRN, 1997).

The organization shares information with farmers around the world by producing scripts suitable for radio broadcast. Its members include broadcasters, agricultural extension workers, community health workers, teachers and others who work with rural communities. DCFRN provides information packages in a script format to its members. The chosen medium for information dissemination, once the information packages are in the hands of members, is radio through which DCFRN hopes to reach a large number of rural communities who may not have access to this type of information. DCFRN scripts have also been used in community dramas, classroom teaching materials, videos, posters and leaflets.

The organization distributes scripts on agriculture and health in English, French and Spanish. The audience is estimated at about 500 million people located in approximately 100 developing countries. DCFRN expressed the hope in its 1996-1997 annual report that their Internet site "will allow us to reach even more people." In DCFRN's 1997-1998 annual report, two aspirations were expressed in which an on-line network might be beneficial:

i. "More regional partners will enable the Network to respond directly to specific local conditions affecting farmers in other parts of the world. Our partnerships will enhance our participatory approach and provide opportunities to increase the capacity of organizations, communities and individuals for self-directed action."

ii. Farmers "must be able to voice their questions and concerns, and to share, amongst themselves, their strategies for success."

DCFRN is currently redefining its mission and membership. During this review DCFRN is examining the role of the Internet in three areas. First, it could become an alternative communication channel between DCFRN and its members. Second, it could provide resources never before available to members and others who might visit or search for related material on the website. Third, it could create an opportunity to develop not only a member network but also links to other NGOs or potential partners.

There is a desire to move towards decentralization in DCFRN as indicated by the establishment of regional partners in South Africa, Russia and Latin America (Honduras and Peru). Establishing regional partners gives DCFRN a stronger presence in those regions via the local partnership. Nancy Bennett, the Executive Director of DCFRN, has stated on more than one occasion that a goal of DCFRN is to create information packages solely authored by members and their audience. This move would change the present situation in which approximately one-half to three-quarters of the information in the packages is written by staff in Canada and only a one-quarter to one-half are contributions from the member base. Ideally, DCFRN would like to edit the information packages, not produce them. The extent to which the Internet might contribute to these goals is the underlying rationale for my research.

Background to this Thesis

My interest in DCFRN dates back prior to beginning graduate work. I admired the vision of the organization and its work in developing countries. I had an interest in communication and networking and was beginning to explore media in communication.

Together we discussed the potential role of the Internet for the organization and how the medium could benefit the organization and its members. Recognizing that scant communication transpired between members and even between members and DCFRN, a possibility existed that the medium could nurture communication as well as the delivery system of the information packages. The study therefore focuses on the appropriateness of and access to technology in communication for development within DCFRN. It concentrates on the social elements of participation with and use of new technology, such as the Internet.

Statement of Research Goal and Objectives

The study investigated the introduction of a complementary communication support system in DCFRN. The organization's current communication is predominantly dependent on courier and national and international mail systems with occasional use of e-mail. More specifically, the study examined one communication medium – the Internet - to enhance the delivery of scripts and communication between the organization and its members. Currently, information packages are mailed in good faith, hoping that the information is useful to members and their audiences. Additionally, the bulk of research and script development is completed at the organization's office in Toronto. Although the majority of scripts include contributions from a good number of members, the organization would like an increase in member contributions. This desire for an increase in contributions can be reflected in the current strategic plan of the organization. In October, 2000, staff, board members and members voiced the desire to develop a strategy to attract, retain and utilize talent (members), offer programs that are needs-driven and develop and strengthen broadcaster capacity. These goals cannot be attained without the

participation and contribution of member knowledge and information. The goal of the study was to examine the current and potential use of the Internet to provide and exchange information and create an on-line network. The goal was achieved by addressing the following objectives:

- To investigate the attitudes of DCFRN members to the use of on-line communication;
- To explore how members use the Internet;
- To investigate how valuable scripts are to members and the importance of timely dissemination of information;
- To determine the hardware and software specifications of equipment currently in use;
- To identify the barriers in the use of the Internet with DCFRN;
- To identify incentives for promoting the use of the Internet with DCFRN.

Therefore the following question presented itself for study:

> How feasible is it for the Developing Countries Farm Radio Network to use a communication and information delivery network that involves the Internet?

The volume, diversity and richness of information sought and provided by the survey, on-line discussion and personal interviews made it necessary to limit the scope of the research to the above area.

Rationale for the Study

The guiding assumption of this study, then, is that the Internet component of DCFRN's communication system may enhance communication with its members and establish an on-line network where vital information can be shared among members. A series of sub-assumptions can be derived from this guiding assumption:

- Information shared with members, such as broadcasters and extension workers who have on-line access may help DCFRN receive evaluation on the scripts;

- On-line communication can facilitate a two-way communication stream between DCFRN and its members;
- Members who have access to the on-line technology can help DCFRN with information and research for future information packages;
- On-line communication can enhance the efficiency of delivery of information packages to members who have access to the Internet;
- On-line communication can establish a flourishing on-line network where ideas, comments, debates, conversations and information exchange can occur between DCFRN members;
- An on-line searchable database of past scripts will provide a useful resource for DCFRN members.

Significance of the Study

In a time when telecommunication is proliferating and increasingly being used in development, it is important for DCFRN to explore the possibility of using new technology. Research on the effectiveness of the Internet has not been thoroughly recorded due to the relatively recent introduction and use by society. The medium is still a new phenomenon where, in general, the average individual (most likely in a developed country) has only used it for approximately five years. The study has hopefully contributed to the understanding of technology in rural development and has the potential to benefit three audiences. The first audience is members of DCFRN who participated in the survey, on-line discussion and personal interviews. They were able to participate in a study with DCFRN and share their knowledge and experiences. The second audience is the staff and board of directors of DCFRN to impart information on how their members use the Internet and the potential use of the medium in collaboration with the organization. The third audience is other NGOs who are interested in the study and

future model of the DCFRN on-line network to learn and understand the medium as a communication tool.

Limitations of the Study

The limitations of the study were:

- The number of participants was small because of the small number of members and other stakeholders having access to the Internet;
- When interpreting the data it was important to remember that respondents were current Internet users interested enough to participate in the study and did not represent all members of DCFRN whom are Internet users;
- The sample size of completed surveys was small in relation to the population (the total number of members) to be truly representative. However, respondents were self-selected because they chose whether or not to participate because an invitation was extended to all members of the organization;
- Although radio is the main communication medium focus of DCFRN, the focus of the study is the Internet. It did not look at the convergence of radio and the Internet.

Chapter Two

LITERATURE REVIEW

There is always more freedom in the design of the instrument than in its use.

A saying by an old Colombian designer of guitars. Stated by Manuel Rozental– keynote speaker at the Ontario Council for International Co-operation Conference, *Technology and Culture, Knowledge Across Borders* April 8, 2000.

Introduction

Chapter Two reviews literature on the use of Internet in communication for development. The term "communication for development" is introduced to provide the context for this thesis. The role of the Internet as a medium for development is explored including three short synopses of the Internet in the non-governmental organization (NGO) sector. Two examples of Internet-based networks in international development are documented including a study on the use of the Internet with Ugandan NGOs. The chapter concludes with a look at possible future connectivity followed by a summary. For purposes of this review and study, the term "Internet" refers to e-mail services and World Wide Web (WWW) services.

Communication for Development

It is necessary to look at the origin of *development* and *communication* to understand how communication for development evolved as a field of study. The word "development" is quite evasive. Its definition has mutated into several meanings and into various contexts. Today there are no valid blueprints available for "development" (Servaes, 1999). The first widespread use and mass adoption of the word originated with the United States Point Four Program based on the success of the Marshall Plan. In 1949,

the Point Four Program aimed to help more than half of the world's population whose basic needs were not being met. This help came in the form of Western advances in agriculture, commerce, industry and health and were to be transferred to countries in need (Servaes, 1999; Melkote, 1991). This was the first major development plan aimed at developing countries. It was top-down and technically oriented and it involved the transfer of knowledge from a 'superior' culture to those that were 'backward'.

The trickle-down effect did not materialize and in many areas the poor were getting poorer. However, as time passed, new development theories emerged and it became apparent that development not only rested on the transfer and adoption of Western innovations but was conditioned by culture, tradition, geography and participation.

The Marshall Plan and Point Four Program were products of the Modernization theory. There are three major paradigms[1] that contribute to the evolution of development theory. The first was Modernization Theory, the second was Dependency Theory and the third, Multiplicity Theory. The essence of Modernization Theory is that it was believed that any problem of underdevelopment or backwardness could be solved by the application of the economic and political systems of the West. The major assumption was that the difference between the West and developing countries was a matter of the degree of development, not a matter of the kind of development (Servaes, 1999; Yoon, 1996).

Dependency Theory arose from questions beginning in Latin America about the paradigm of modernization. Although Dependency Theory criticized Modernization

[1] A paradigm is what members of a scientific community share where women and men organize, research and structure intellectual curiosity to provide an appropriate focus for scientific disciplines (Kuhn, 1970; Janos in Servaes, 1999).

Theory, it built on it rather than being radically different or providing alternatives. This theory was concerned with the effects of dependency in peripheral countries where development and underdevelopment needed to be understood in the context of a world system. There was a push towards a more global perspective. (Servaes, 1999). It was believed that development and underdevelopment were the consequences of each other as the developed metropolis underdeveloped the periphery. The solution to underdevelopment was not thought to come from the adoption of Western technologies but rested on the way the whole world was structured – developed countries made progress at the expense of developing countries (Yoon, 1996).

Multiplicity theory, on the other hand, focused on elements that were ignored in the first two theories and emphasized the multiplicity of viewpoints and associated methodological approaches. The underlying meaning behind Multiplicity Theory was that there was no universal path to development and that development must be viewed as an integral, multidimensional and dialectic process that differs from one country to the next (Servaes, 1999).

The definition of development continues to evolve. What began as an economic initiative now includes more complete elements such as culture, society and participation. It must consider all aspects in a given society if progress is to be made.

The word "communication" can similarly convey different meanings. It can be thought synonymous to talking where the purpose is to share knowledge without the intention of influence. The *Gage Canadian Dictionary* defines it as "to exchange information or signals by talk; to transmit; to get in touch with; and to be connected" (1983: 235). The Latin root for communication is *communicare*, which means "to make

common" (*Webster's New World English Dictionary*, 1988). Rogers described communication as "a process by which participants create and share information with one another in order to reach a mutual understanding" (in Agunga, 1997: 225).

There are three major approaches that contribute to our understanding on the role of communication in development theory and practice: the Communication Effects Approach, the Diffusion of Innovations Approach and the Mass Media and Modernization approach.

Melkote (1991) states that the Communication Effects Approach is based on the "Bullet theory" in which communication is a linear and a one-way flow from a powerful source to a passive receiver. This approach is based on the assumption of the causal relationship between the elements of communication and the process of development (Mowlana and Wilson, 1990). The "bullet" effects of media were to be a "quick and efficient answer to a myriad of social ills" (Servaes, 1999: 46). This "source-transmitter-channel-receiver-destination" model was adopted for three reasons. First, communication was basically thought of as the transfer of information and therefore could lend itself to empirical methodology and the establishment of communication as a distinct and legitimate science. Second, there was a focus on the efficiency, or effects, of communication. This meant control over message "receivers" by vested interests, which were the "sources". Third, the communication effects model suited the nature of mass or mediated communication which was quite a powerful force at the time (Servaes, 1999).

However, a shift in thought by communication scholars occurred and they began to suggest that mass media were more agents of reinforcement than agents of attitudinal and behavioural change. The idea of the "two-step-flow of communication" was

explored. A population was divided into "active" and "passive" groups. Instead of direct contact between a "stimulus" and a "respondent" two methods were employed to deliver the message. First, a population was made "aware" through mass media and was then followed by some form of personal influence, such as personal visits. Mass communication's role was to spread awareness of new possibilities and practices on whether or not to adopt innovations but when the time came to make a decision, personal communication was more likely to be influential (Servaes, 1999). However, this theory had little impact in practice. Policy makers in developing countries saw mass media as a quick way to receive money and held onto the belief that they initiated behavioural change among people. They favoured the modernizing objectives of the state and therefore continued to ignore the growing awareness on the different roles of mass media (Melkote, 1991).

The Diffusion of Innovations Approach is based on the assumption that the only way for progress is to 'develop' from a traditional livelihood to a modern one through the acceptance of new ideas from external sources. Everett Rogers, creator of the diffusion theory, identified the elements in the diffusion of an idea or innovation. He believed that adoption occurred when an individual decided to adopt or reject an innovation from the time of first awareness through five stages: awareness, interest, evaluation, trial, adoption (Rogers, 1971; 1962). This research established the importance of communication in the modernization process at the local level. Communication was believed to be the important link between exogenous ideas and entered local communities (Melkote, 1991).

However, communication was only seen as the transfer of new ideas from willing experts to an assumed ignorant target social system. Communication was information

and this fit nicely into the modernization paradigm where financial, technical and expert technical human resources were provided to impoverished developing countries (Moemeka, 2000). As Rogers (1986: 49) implied, the role of communication was "to transfer technological innovations from development agencies to their clients [and] to create an appetite for change through raising a 'climate for modernization' among members of the public."

There was an underlying assumption that communication itself would generate development regardless of the socio-economic and political conditions (Moemeka, 2000). Most development technicians held strong beliefs that communicators were simply producers of materials to help them diffuse their messages more effectively. They employed mass media and audio-visual material to try and reach more people with the information they thought best for the intended beneficiaries (Fraser and Restrepo-Estrada, 1998).

The role of mass media was to serve as agents of modernization. It was ideal for transferring new ideas and models from developed countries to developing countries, from urban areas to rural areas. Mass media's task was to prepare the developing countries for rapid social change by establishing a climate of modernization (Melkote, 1991). This psycho-sociological or behaviouristic perspective was concerned with individual and attitude change. Mass media stimulated in direct and indirect ways the mobility and economic development which led to change and modernization (Servaes, 1999; Yoon, 1996). Information was considered the missing link in development (Melkote, 1991).

One lead supporter of mass media for modernization was Wilbur Schramm. In 1964, he published his famous book, *Mass Media and National Development: The Role of Information in Developing Countries* which concerned itself with the potential role of mass media communication in national (social, economic, political and human) development (Schramm, 1964). No distinction was made between communication and information and he created a notion that communication for development was simply a transfer of information from government and donor agencies to recipient target social systems. Similar to Rogers, Schramm believed that attitude and behavioural change would occur if facts and figures were simply presented. However, both Rogers and Schramm ignored pre-existing socio-cultural and structural conditions surrounding the acceptance of new ideas (Moemeka, 2000).

One prominent advocate of communication for development was Erskine Childers. His general view was that communication should be used to create a better understanding about projects among local people and society in general and to apply audio-visual media to information and training. Although he worked within a modernization framework, his influence in the United Nations opened the door for communication as an important part of the development process (Fraser and Restrepo-Estrada, 1998).

By the 1970's, communication scholars realized that mass media were affected by extraneous factors instead of being independent variables. Mass media were criticized for their dependency on scientific knowledge, research and United States models instead of on the reality of developing countries. Mass communication did not provide explanations on factors of social change (Servaes, 1999). Message content was not

considered and the media were viewed as pro-technology, pro-source, pro-persuasion, one-way flow and pro-progressive leaving subsistence communities behind (Melkote, 1991). The role assigned to communication was similar to that of development: an elitist, vertical or top-down process (Servaes, 1999). Servaes' synthesizes development and communication (1999:47):

- Similarities characterize the progression of both development and communication theories. Modernization and "bullet" or unilinear communication approaches, both view their mission primarily as "us to them."

- Derived from a worldview of dominance over one's environment, the Western conception of communication is overwhelmingly oriented toward persuasion.

- The diffusion and development support communication approaches are congruent with earlier philosophy. They tend to assign responsibility for the problem of underdevelopment to peoples residing in those societies.

- Mass media play the preeminent role in the campaign of development through communication, and early predictions were of great effects. Bidirectional models and strategies such as feedback were added to render the initial message more effective.

- Development as modernization and communication as one-way persuasion reached their zenith through the diffusion of innovations, the two-step-flow, and other "social marketing" strategies of attitude and behaviour change at "underdeveloped" peoples.

- Mass audiences were "influenced" with predispositions toward development and social institutions. Such media technology has been taken either as the sole solution, the driving force, or as simply a value-free tool in the process of development.

- Research of the diffusion approach, like the modernization and dependency theories, suffers from an overemphasis on quantitative criteria to the exclusion of social and cultural factors. As a result, the manner in which foreign media hardware and software interact within a cultural context is largely unexplored.

Although the field of communication for development is still evolving and includes a vast array of definitions and approaches, differences are only seen in degrees not in substance. Most refer to 'participation', 'understanding' and 'positive change'

(Moemeka, 2000). Ultimately, the aim is to create a non-threatening environment in which people are willing to participate. As Moemeka states, the goal is "to discuss with, inform and motivate the people and create an environment in which target social systems can feel the need for, and demonstrate their commitment to, development activities and thus raise the level of their participation in development projects" (2000: 13).

This specialized field can be described in three parts: science, art and craft. It is part science because it draws on the theory and methods of social and behavioural science, on individual and group psychology, and on principles of adult education. Communication as a social science means that if a communication strategy is planned effectively, more people will accept the information one is trying to share. It is part art because it incorporates artistic talents and skills such as graphics, photography, radio and video production and instructional design. For example, it involves the creative challenge such as using traditional media to keep the attention of local groups. Finally, it is part craft because it involves learnable skills with a variety of aids and equipment such as cameras, projectors, video recorders and editing suites, computers, newspaper production and the paraphernalia of telecommunications and broadcasting (Fraser and Restrepo-Estrada, 1998; Agunga, 1997: 226-7).

The bottom-up process of development has expanded the use of mass media. The traditional role of audio-visual media to improve the effectiveness of information and training programmes is still beneficial but now there is more focus on community media and improved interpersonal communication between development workers and the intended beneficiaries. Fraser and Restrepo-Estrada (1998) believe there are three aims in today's development strategies. First, communication is aimed to stimulate debate and

'conscientization' for participatory decision-making and action. Second, to help people acquire new knowledge and skills. Third, to promote teamwork, co-operation and coordination between governmental or non-governmental organizations involved in development.

The term "communication for development" is used to describe the process of two-way dialogue and expression that encourage sharing of feelings, desires, beliefs and experiences, together with problem analysis, exploration of solutions, and bottom-up communication that raises the awareness of decision-makers to those problems (Richardson, 1998b). Thus, communication for development entails getting people linked not only with infrastructure but with training and attitude and behavioural change to help adopt alternative media for communication.

Communication for development is created by multiple stakeholders and their generation and exchange of information. Ramirez (1998) states that it is about i) aiding different types of actors interested in understanding needs and assessing opportunities jointly, ii) providing methods and media to reach a common meaning and iii) enabling negotiation with actors with differing perceptions and interests. The challenge and need of communication for development is to link different viewpoints and create a common language where contrasting interpretations of reality between rural population and policy makers and between scientists and field staff exist. All stakeholders constitute an entry point into the field and without two-way communication, development may not occur.

A communication model with active social participation must have the following components (Somavia in Servaes, 1999: 86):

- Communication is a human need: The right to inform and be informed, and the right to communicate, are essential human rights, both individually and collectively;

- Communication is a delegated right: Within its own cultural, political, economic, and historical context, each society has to be able to define independently the concrete form in which it wants to organize its social communication process;

- Communication is a facet of the societal emancipation and liberation process: The social responsibility of the media in the process of social change is very great;

- The communication task involves rights and obligations: Because of media, in fact, provide a public service, they must carry it out in a framework of social and juridical responsibility that reflects the social consensus of the society. In other words, there are no rights without obligations.

Rarely has a development project or plan been successful without communication and without some degree of attitudinal or behavioural change. It needs clear objectives, identification of different audience groups, qualitative research with the audiences, careful message design and choice of channels, and monitoring and feedback (Fraser and Restrepo-Estrada, 1998).

The Internet

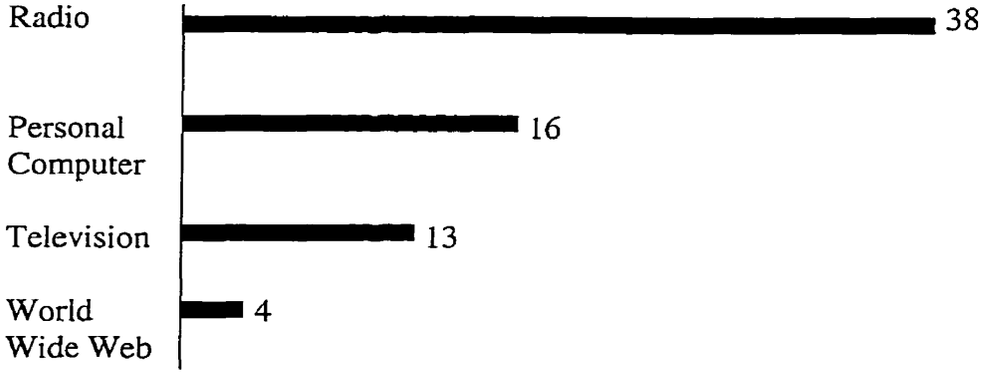
The Internet is probably the world's largest communication medium. This phenomenon of the Internet began in the 1960s in the United States as a form of fail-safe communication within the Department of Defense in case of a nuclear attack. It was created and designed in 1963 by Larry Roberts, working for the Advanced Research Projects Agency (ARPA) with financial support from the United States Department of Defense (Negroponte in Richardson, 1998) and later emerged as a communication tool for a few Department of Defense workers and contractors. In order to ensure a fail-safe system, the design of the communication system was decentralized in nature.

The system allowed people to send packets of information from a technology called Interface Message Processor (IMP). The technology could split large sections of data into small parts called packets each labelled with a destination address. The packets could be sent in any order and through different routes and still end up at the same destination. If one or several routes were destroyed or malfunctioning, the packets could find alternative routes to reach their destination. Once the packets arrived at their destination, they would reassemble to its original version (Richardson, 1998).

The Internet has grown at a phenomenal rate and from its inception it has been difficult to measure the number of users accurately. The original ARPAnet community numbered approximately one thousand users in 1969 (Rheingold in Truelove, 1996). By 1998, the number of users was estimated between 50 and 100 million (Richardson, 1998). Figure 2.1 compares the widespread acceptance of new technologies.

Figure 2.1 Widespread Acceptance of New Technologies

Question: How long before new technologies gain widespread acceptance? (Years from inception to 50 million users)



Source: Economist in Ontario· Council for International Co-operation, 2000

It is apparent the Internet is a new communication force unlike any experienced in the past. This trend will continue because the Internet has become a people's network

(Richardson, 1998) where the freedom and the ability to communicate is more of a possibility (once you have access and the infrastructure) than with any other communication medium.

This medium allows one to become a publisher and a communicator at the same time along with the choice to communicate one-to-one, one-to-many and many-to-many, choices not comparable to other traditional media (IM Europe, 1999). For example, the telephone is used to communicate one-to-one and sometimes, many-to-many with conference calls. The use of video can employ all three (one-to-one, one-to-many, many-to-many) but, in general, for the average person or village it cannot be simultaneously interactive. The general design of radio is one-to-many where the main goal is to disseminate information to a large number of people. People have adapted radio for two-way communication as in the case of the National Farm Radio Forum (1936–1965) in Canada[2].

The most well known features of the Internet are the World Wide Web, e-mail and Usenet or newsgroups. To search for information, one would use the WWW, the area where pages with text, graphics, sound and video clips may be seen. Pages are linked to each other by a series of "hyper-links" offering a way to navigate through Web content. These pages may be published by anyone who has access to storage space on a "host" computer connected to the Internet running the appropriate software (a Web server or site) (IM Europe, 1999; Spore, 1997).

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[2] The forum was based on the idea that people would interact with radio through study groups who listened and discussed the programs, documented their discussion and sent the document to Canadian Broadcasting Corporation where the information was reviewed on the following program.

E-mail allows people to communicate with an e-mail address. It is easy to send out the same message to multiple addresses by either inputting each address in the designated space or by mailing lists. In general, the author of the e-mail is identified by their e-mail address but some systems have been created in which the sender's identity is anonymous. A message sent to an e-mail address is stored in the recipient mailbox on the mail server maintained by the access provider until it is retrieved by the recipient (IM Europe, 1999; Spore, 1997).

Usenet is similar to a notice board where anyone, anywhere can look at notices and news and on which people can post their own notices. The content is provided by persons who can send messages (either simple text or text with graphics). The messages are not stored in one place but copied from one newsgroup server to another. This type of Internet use requires a large amount of storage space and therefore the information is only available for a certain time period before being cancelled. There are also sites where archives of newsgroup content are stored and can be searched (IM Europe, 1999; Spore, 1997).

Initial Use of Internet in NGO Sector – Three Examples

Opportunities exist for civil society actors (such as NGOs, individuals, small companies) to benefit from the Internet. The following NGOs chose to make use of the medium as a tool for change.

1. The Association for Progressive Communications Network

Interestingly enough, a network of NGOs understood the potential of the Internet and began to use the medium as a tool for communication long before it became part of big business. The Association for Progressive Communications (APC Networks)

(http://www-apc.planet.apc.org/english/ngos/business/buscase/index.htm) was founded by a group of seven organizations that provided e-mail and on-line discussion forums to NGOs since the mid-1980s. The group included IBASE (Alternex), GreenNet in the UK, Nicarao in Nicaragua, IGC (PeaceNet and EcoNet) in the US, NordNet in Sweden, Pegasus and Web Networks. It was officially formed in May 1990, and since then the APC has grown to a network of 25 organizations serving over 50,000 civil society users (Surman, 1999).

APC Networks was born out of the desire to provide Internet access to NGOs and communities, actors of civil society, with the freedom to express political views. In the late 1980's they formed an alliance with other networks around the world to create an electronic network and offer connectivity with their own e-mail services. This e-mail network may seem trivial today but then the Internet was unheard of on a large scale. However, the cost of sending an international e-mail remained relatively expensive due to an internally structured system. APC responded to this challenge by providing Internet access in which the cost was relatively lower compared to the telephone or fax.

APC Networks enjoyed success until 1994/95 when the Internet exploded on the scene and was made accessible to the average (developed country) individual. Money flowed into this sector but bypassed APC Networks. Instead it went to corporations such as AOL and Compuserve – the big Internet companies. NGO attention shifted away from APC Networks to corporations that made Internet access easier and less expensive.

Instead of fading into the background, APC Networks chose a niche where big business was weak and searched for ways to remain useful and meaningful to NGOs. Presently, APC Networks' focus is not so much on connectivity to the Internet but on

content and information. Their goal is to find ways to help NGO's gain a presence on the Internet by creating a voice for civil society and to build on that voice. This is a formidable challenge when big business is virtually everywhere. APC Networks has moved to a grassroots network and membership-style co-operative. In ideal circumstances the membership base model will use their collective voice to become active in civil society (Surman, 2000). APC Networks have been able to sustain themselves in this transformational market by continuously adapting to change.

2. SANGONeT – South Africa

SANGONeT (http://wn.sangonet.com) was the first comprehensive electronic network serving NGOs and civil society in South Africa. Electronic networks in other countries attempt to learn and emulate this model. SANGONeT is a regional electronic information and communication network for development and human rights workers. It promotes development, social justice and open and accountable government through affordable and accessible communication. Those who benefit from this service are NGOs, community based organizations (CBOs), governments and the private sector.

SANGONeT provides four major services which are relevant information, communication, training and support and Internet demonstrations and discussion forums. SANGONeT makes the task of searching for information on the Internet easier. Finding information on the Internet can be overwhelming when there is an abundance of information on the WWW. Researching can be tedious and futile especially if the search engine looks at each word separately. One inquiry can provide thousands and thousands of hits (potential information sources) and in general, the context of the information is different from the context of the original inquiry. This could lead to an unsuccessful and

frustrating waste of valuable time. To avoid this frustration SANGONeT provides links directly related to an inquiry, searches for information and provides a guide to other useful information sites on the WWW. The ten major information areas SANGONeT provides are:

- Women;
- Environment;
- Human Rights;
- Information Technology;
- Development;
- Education;
- Open Government;
- Labour and Economy;
- Housing;
- Health.

E-mail is a popular medium for communication because of the ability to communicate with individuals or groups anywhere in the world. SANGONeT provides software for Windows, DOS and Macintosh and will set up an e-mail gateway for Local Area Networks (LAN).

SANGONeT provides training in the use of technology to searching for information on the WWW as well as back-up services, including technical support and advice in effective use and management of information. Weekly training sessions are located in the city of Gauteng and periodically in other parts of the country so they can reach those who are not able to travel. The training courses offered by SANGONeT are Introductory Internet Training, HTML and Web Publishing, List Management, Using Internet as a Research Tool and Lobbying and Advocacy. An example of the content SANGONeT provides in a training course, such as 'Using Internet as a research tool' include building a resource bank, identifying useful supersites, getting the most out of search engines, tackling research queries and using on-line databases.

3. Information Agency Pulsar - AMARC

Pulsar (http://www.amarc.org/pulsar/index.html) was founded in 1996 by AMARC[3] whose focus was on converging radio and information and communication technologies (ICTs) as tools for development. This agency acts as a medium where community radio and commercial broadcasters, other communication media agencies, governmental and non-governmental organizations, universities and production centres search for and exchange information. Pulsar is operated and administered by the AMARC Latin America and Caribbean Office in Ecuador and is founded by ASDI (Sweden), CAF (Holland), the Friedrich Ebert Foundation (Germany) and the United National Educational, Scientific and Cultural Organization (UNESCO).

Pulsar offers an on-line service, via e-mail, of daily and weekly news bulletins in Spanish. This information is edited to conform to radio diffusion standards and is focused on regional concerns. It includes many perspectives from civil society. A user has the option to subscribe as an individual or belong to a group. Pulsar also has a website (updated every three hours) where subscribers and non-subscribers have access to information. In the near future, an audio format of news and bulletins will be available.

The uniqueness of Pulsar is based on the diversity of members both geographically and culturally. A majority of members are from Latin America and the Caribbean but there are members from North America, Europe, Asia and Africa. The quality of information is attributed to a team of journalists in Quito, Ecuador with a group of correspondents in all Latin American countries and some European countries.

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[3] AMARC is an international non-governmental organization which serves the community radio movement. Created in 1983 it continues to grow representing over 2500 members in 106 countries (on-line: http://www.amarc.org/AMARC/AMARC_En/).

Presently, AMARC is working on a report about the expectations and achievements on the marriage of radio and Internet. It is focused on presenting a different view in which new technologies can be used to benefit world communication as they believe everyone has a right to communicate.

Benefits of the Internet

Boldt (1997) states that the Internet use means that information is no longer a one-way flow. It is a multipurpose tool and perhaps the most flexible medium currently available. The Internet has the potential to incorporate a wide variety of objectives such as local participation, training, education, research, technical support and institutional strengthening (Richardson, 1998). "If used as a tool for encouraging two-way communication processes and creating links between people, then it may open up new opportunities for rural people to participate in the global society" (Richardson and Paisley, 1998:8).

The Internet has the power to move across any social and geographical distance and help people find new ways of facilitating the flow of information and knowledge (Richardson, 1998). It is teaching us that knowledge sharing is crucial (McNeil, 1998). Unlike other media, such as radio and television, the Internet allows one to be an information producer and knowledge sharer (Richardson, 1998). It is a tool for collaboration and although it can be mistaken as the solution for collaboration, it must be used appropriately and cautiously. Only meaningful collaboration can lead to action and this takes time and effort to nurture.

The cost of communicating via the Internet is a fraction (once the infrastructure and access is implemented) of the cost to use the telephone or fax due to the system of

packet switching (Richardson, 1998). The Internet has the possibility of bridging time and distance. An e-mail message can travel along a telephone line while an indefinite number of other messages use the same line. Compared to making a telephone call or sending a fax, in which only two people use an entire line, the cost is drastically reduced. NGOs in many developing countries are using the Internet simply because they cannot afford the use of the telephone or fax (Boldt, 1997). A growing number of indigenous organizations in the South and North are making use of the new technologies – a trend highlighted in the *World Culture Report* (C.G., 1998). In Africa, e-mail has been adopted by almost every agency with international communication needs because of the drastic reduction in costs (Jensen, 1998; Boldt, 1997). A Copenhagen-based International Work Group on Indigenous Affairs has helped 20 to 30 indigenous organizations in Latin America become equipped with e-mail because, "it's much cheaper to communicate via e-mail" (C.G., 1998). Ironically enough, some NGOs in Latin America are ahead of their partners in industrialized nations. One official of the Konrad Adenauer Foundation in Bonn stated, "our partners in Latin America are always asking for our e-mail address and about our homepage on the World Wide Web" (Boldt 1997: 11). The decentralized nature and relatively lower cost of the Internet have made the medium useful for many people and organizations.

The benefits of using the Internet in rural areas are numerous. Bessette (1996: 12) reports that the most important benefit of rural telecommunication systems lies in their use as tools for interpersonal communication, which is the foundation of communication for development. Rural telecommunication systems enable rural people and organizations to communicate and share information in three ways (Richardson, 1998b):

- within communities and villages;
- horizontally with other communities and villages;
- vertically to friends, relatives, peers, and government and non-governmental organizations (NGOs) in urban and international contexts.

The medium enhances the above flow of communication and can be beneficial if it is appropriated to the specific context.

Good communication to and between rural people has been a prerequisite for agricultural development and yet many farmers still lack the basic knowledge and self-confidence to try and improve their agricultural techniques (Spore, 1988). Access to timely agricultural market information is one of the most important factors in fostering a satisfactory livelihood. Outdated localized information can have a negative impact when the price of produce on the international market is volatile.

For rural areas, connectivity means staying in touch with family, friends and business contacts who are geographically distant. It promotes business connections, helps people make better informed decisions and permits increased access to services such as health and nutrition. According to Richardson (1998), connectivity means education and progress.

World Wide Web and e-mail information services have shown phenomenal growth rates and have brought prosperity and economic development to users and providers of the medium (Spore, 1997). Thus enhanced communication services and accessibility of information are related to social and economic development (Richardson and Paisley, 1998). The United States Agency for International Development (USAID) has also recognized that improved communication and information access are directly related to improved agricultural production, food security, and rural development (Chronical, 1998).

Rural people are adept in appropriating technologies for their own goals and objectives (Richardson and Paisley, 1998). The appeal of telecommunication systems as tools for development is not the technology or information but the enhanced ability of people to share knowledge with one another (Smolan, 1996). For example, the Nunavut Planning Commission in the Canadian Arctic created their own website (in English and Inuktitut) and used digital technology to map out caribou migrations and land resources, based on information collected by people in the communities. As one planning member stated, "To me, this is just another tool. Canadians tend to look at people in the north as clinging to survival, living isolated and insular lives, whereas in fact, Inuit culture is vibrant and people are using the new technologies to reach out to the world" (C.G., 1998:9). In many instances, communication information centres and farmers' organizations gather information from the Internet and disseminate it via local radio stations, newspapers and other local information sharing networks and tools (Richardson, 1998).

The Internet is a valuable tool when placed in the hands of local communication conduits or intermediaries (Richardson, 1998). It has the potential to strengthen linkages between and among farmers' organizations, extension workers, researchers and policy makers especially when a network is formed. A network can be defined as an infrastructure in which patterns and lines of communication are drawn up in advance. People communicate through the infrastructure and can interact in different ways, reach comprimises, and find solutions to problems. Mailing lists are maintained and various programs are co-ordinated through networks (Arora-Jonsson, 1999/2000).

Networking can occur through networks; however not all networking takes place there. According to Arora-Jonsson (1999/2000), there are two general categories. In the first category of networking, lines of routine communication are often established as an effort to enable people to keep in touch and exchange information. The second category of networking is quite similar to the first but is loosely structured and often temporary especially when the purpose of networking is short term.

Information can be distributed or published almost immediately on the Internet at a fraction of the cost to print and deliver material. This is an important benefit for those who need information immediately such as those working with natural disaster emergencies. As well, archival lists of resources can be obtained and used in the most remote locations as long as one has connectivity (Richardson, 1998). Having information at your fingertips instead of requesting and waiting for material is beneficial.

The Internet can enable bottom-up research and sharing of local knowledge. It is easier to disseminate information on the WWW, e-mail listservs and Usenets than it is to print, publish and distribute. Richardson (1998) summarizes the benefits the Internet offers to rural areas:

- Increased efficiency in the use of development resources;
- Less duplication of activities;
- Reduced communication costs;
- Global access to information and human resources.

Concerns with the Internet

In any given situation the possibility remains that the Internet may be used inappropriately, be provided in an unequal manner, and prove useless to people's needs (Richardson, 1998). When introducing a new technology for communication in rural areas, it is important to be aware that people "not only 'need' the service, but that they

also have the opportunity to become fully aware of what the system can do (educational process), become comfortable with the technology and WANT to use it" (Black, 1986:17). For example, in 1995, the World Health Organization's Regional Office for the Americas launched a project to create an electronic disaster management network in Central America. The objective was to improve communication among disaster managers and provide access to global sources of information. Though intentions were sincere and the infrastructure was established, no thought was given how dialogue would begin and be managed. This lack of planning and foresight led to the failure of the initial project because the media were not used and communication did not improve among the disaster managers. Project planners went back to the table, learned their lessons and began again (Bittner and de Goyet, 1997). Technology should not become a 'solution in search of a problem' (Black, 1986).

Although Internet infrastructure and access can be expensive, once they are implemented, they are relatively cheap compared to other types of media. Moreover, there is no escaping the fact that good communication is costly to implement and use. Lack of funding can lead to loss of potential opportunities the Internet might offer. However, it is important to analyze the pros and cons of implementation of any media. Bad communication is more expensive than the most costly medium in terms of future wasted resources and opportunities (Spore, 1988).

The problem of validating information exists. Information must be accurate to be of any use and often with a new or sophisticated medium there is a temptation to feel that all information provided (or published on-line) is reliable. In many parts of the world, the infatuation with the actual technology itself has subsided somewhat and now the

consequences of having such an abundance of information, whether myth or reality, accurate or sensational, is being scrutinized. For example, in 1994, the Internet played a consequential role in the Zapatista Movement in Chiapas, Mexico. The Mexican government attempted to blanket the growing violence and oppression by controlling the television and press since media coverage came from the state controlled TV network, Televisa. However, through personal interviews with independent journalists, e-mails and the WWW, the Zapatistas were able to disseminate information to the international community (Cleaver, 1998). This led to growing support for the Zapatista Movement and pressure on the Mexican government. According to Adler Hellman (2000) the bulk of information came from one newspaper and most of the articles regarding the Zapatistas were written by one individual. The information was disseminated internationally and read by many. Even if most of the information was authentic, the dependency on one source meant dependency on one perception.

Additionally, platforms must be created to address language and cultural concerns regarding the Internet (McNeil, 1998). The bulk of information on the Internet is written in English (C.G., 1998). This is a barrier for people who do not know how to read or write English and therefore renders the Internet useless. Ibrahim (2000: 11) of Human Rights Internet in Ottawa, stated that "since traffic started picking up on the information highway in the early 1990s, the hyperbole about its power has ranged from the assertions that on-line users (such as the Zapatistas) had returned to their community a measure of hope, [yet these] declarations of virtual communities are little more than a figment of the imagination." Critical awareness of factors such as the authenticity of the information, censorship along with language and cultural barriers in developing countries (where a

majority of Internet users are men) is necessary if the Internet is to be used as a tool for change. Ibrahim (2000) believes that alternative players (such as women and indigenous groups) need or should be given the chance to make their presence known on the Internet. This inclusion will ensure that information on human rights issues (which is kept under wraps by some governments), women's issues or any other alternative group is allowed to produce information, especially in their own language.

The multitude of cultural identities and autonomous groups can be easily forgotten on the Internet even when cultural identity is the strongest characteristic in many nations. The Internet can conflict with the passion and desire to protect cultural identify and has acted more like a tool for modernization rather than a venue to strengthen cultural diversity. It is crucial to understand how the Internet affects individuals and the global society and there will always be a number of concerns about the impact of Internet adoption on a global scale (Leal, 1999/2000).

The term "information poverty" is already widely used. According to Boldt (1997) fewer than 80 percent of the world's population lack the most basic telecom facilities. We picture ourselves living in a global village, but it is a village with privileged "information haves" and many "information have-nots" (Richardson, 1998). Table 2.1 on the next page shows the number of Internet users in mid-1998.

Table 2.1 Internet Users in 1998

	Regional Population (as a percentage of world population)	**Internet Users (as a percentage of regional population)**
United States	4.7	26.3
OECD (excl. United States)	14.1	6.9
Latin America and the Caribbean	6.8	0.8
South-East Asia and the Pacific	8.6	0.5
East Asia	22.2	0.4
Eastern Europe and the CIS	5.8	0.4
Arab States	4.5	0.2
Sub-Saharan Africa	9.7	0.1
South Asia	23.5	0.04
World	100	2.4

Source: Based on data supplied by Noa, 1999, Networks Wizard, 1998 and IDC, 1999

The reality is that the social, economic and political stages of development vary tremendously and the cultural standpoints are much too controversial to truly live in a global village (Dieter Klee, 1997). Transition to the information society should be done with great caution, especially for developing countries. The dominance of Western technology, values and content control can threaten many countries of the South for it means adopting western technological standards and values (Boldt, 1997; Dieter Klee, 1997). It also presents a danger for traditional, collective societies because the technology is designed for the individual (Boldt, 1997).

Other Internet-Based Networks In Development

Two development-based networks that use the Internet as the main medium for communication need to be mentioned. The first Internet-based network used information and communication technologies to connect women's organizations for women's rights solidarity in Africa and the second Internet-based network connected organizations involved in a myriad of development projects in the poorest parts in Asia and the Pacific.

1. Synergy Gender and Development – NGO ENDA Developing Countries

In this example, the use of the Internet, more specifically e-mail, led to solidarity which in turn led to progress. The Synergy Gender and Development (SYNFEV), an entity of the international NGO ENDA Developing countries, acts on issues of economic autonomy, health and rights for women. They discovered the potential of electronic communication for women in development and decided to support the work of women's organizations in francophone Africa by providing electronic skills and technical support to better serve themselves in their work.

Although there are many women and women's groups who use the Internet to claim their rights, most women's groups in Africa do not have the computers or modems, let alone the training and technical support, to make their voice stronger. SYNFEV felt it was necessary to give African women the means to network electronically and act in solidarity for the defence of women's rights violations. SYNFEV was successful in using the Internet to fight against the religious condemnation of an African film-maker who made a film on female genital mutilation.

SYNFEV began a solidarity campaign for women to unite with similar contexts and interests. They decided to host two five-day workshops (one francophone and one anglophone). Prior to the workshop the participants met on-line for two months in an electronic pre-conference so when the workshops occurred, the collective work had already began. To participate in the workshops the women's organizations had to know how to use e-mail. It turned out that almost all the participants knew the basic functions of e-mail, such as sending and receiving but were not aware of other e-mail functions like how to classify information, prepare collective discussion groups, organize different

types of lists, navigate the WWW, look for information on the Web and circulate it by e-mail lists.

The success of the workshops was realized when a marginal objective of promoting electronic communication and networking skills became a fundamental one. SYNFEV also learned the following from the workshop:

- The anglophone electronic solidarity list is more active than the francophone electronic mailing list (possibly a consequence of more information on the WWW in English);
- Participants would remain active on the electronic list after the workshops if SYNFEV is able to maintain the list;
- Participants wanted electronic communication facilities to be made available in the future in the regional for a so that the information and networking is in place to benefit local initiatives and workshops.

This is a unique example because the workshops were initiated by NGOs and focused on NGOs. Since the workshop, SYNFEV has created a bilingual website called Flamme (http://flamme.org) and is involved in another electronic solidarity list for the Dakar and Beijing Platform. There is a website dedicated to francophone African women (http://www.famafrique.org) and another coalition of women's NGOs have launched a website (http://www.womenaction.org) around the Beijing+5 so that women are able to participate in the Beijing process (Mottin-Sylla, 1999/2000).

SYNFEV's use of the Internet in development is a positive example. Women's groups who could not network in the past were able to with the new technology. In some cases technology was provided. In all cases, some form of training was undertaken. Simply knowing how to send and receive e-mail to discuss and work for solidarity was not enough for the participants. A deeper understanding and practical experience on

other uses, such as creating e-mail listings and WWW navigation, had to be employed. Simply having the technology and access provided limited success; training and collaboration were needed to further the success.

2. Electronic Networking for Rural Asia-Pacific Projects

Electronic Networking for Rural Asia-Pacific Projects (ENRAP) is supported by a number of organizations such as International Fund for Agriculture Development (IFAD), International Development Research Centre (IDRC), Telecommons Development Group (TDG) and Nexus Ireland, each supporting organization playing a different role in the project. ENRAP is a three-year pilot project, which began in 1999, to help bring the Internet to IFAD-supported rural development projects in the poorest parts of Asia and the Pacific. The objectives of this initiative include realizing the benefits of the Internet and to make use of Internet information resources and communication so that rural communities can address their own development objectives.

The intended beneficiaries are located in Asia and the Pacific region who pursue goals ranging from micro-credit to forestry to rebuilding communities after natural disasters. The chosen IFAD projects are located in Bangladesh, China, India, Indonesia, Nepal, Pakistan, Philippines and Sri Lanka. There are three phases to the project and are described as a participatory communication approach:

A. **Connectivity and Electronic Communication:** Projects accessing the Internet with basic to intermediate proficiency and sharing project management, monitoring and other information.
B. **Knowledge Networking between IFAD Projects:** Identify and document best practice and knowledge generated by projects and information exchange between such projects. Form the basis for a knowledge network and develop pilot solutions for replication.
C. **Local Application Development:** Sustainable use of the Internet to support project activities and expanded networking at the local level.

The outcomes of this project are expected to help stakeholders adapt to using electronic communication in problem-solving processes, establish the electronic venue in their organizational structures, understand the potential of electronic networking in the social processes and participate in the exchange of information and knowledge sharing via the Internet (IDRC, 1999).

These were just two examples of Internet based networks. Their success was dependent on many factors but perhaps the most important is the commitment and creativity of the people using the medium and the determination to explore uncharted virtual territory.

A Study on the Use of the Internet in Ugandan NGOs

Another study that relates closely to this research was McConnell's work in Uganda in 1998 involving 33 NGOs. It examined how NGOs with connectivity used the Internet for daily operations, and how they were able to acquire and disseminate information from the Internet to their stakeholders (McConnell, 1999).

McConnell surveyed ISPs (Internet Service Providers) in Uganda to find out the number of Internet clients in the country. This number, approximately 2300, was extremely small when compared to the population of 20 million people and as McConnell stated, "may relate to the clash of societal values and norms taking place between Africa and the developed world" (McConnell, 1999:7). Factors that limited Internet use were the high cost of computers, computer illiteracy, poor educational institutions, high transmission rates for usage and an overall resistance to new ways of communicating when they were socially content using a telephone, sending a message via a driver or delivering it in person (Balidawwa in McConnell, 1999). There was a need for awareness

about the technology and its uses (Woherem in McConnell, 1999). McConnell observed (1999: 7), "until information technology and knowledge become appreciated and integrated into African society, computers and the Internet will risk remaining an elitist tool under-utilised by the majority of people." Some of the key findings in the study were Internet-acquired information reached both NGOs and their stakeholders, the Internet was used to access and research documents relevant to NGOs, and e-mail was predominantly used to communicate with international partners due to the relative ease of communication and lower cost compared to other communication channels.

Future Connectivity

The popularity of the Internet and its appeal to donor agencies, NGOs, and various rural and agricultural development organization interested in knowledge sharing, learning and communication is having a big impact on the efforts to advance rural telecommunications (Richardson, 1998). In rural areas of some developing countries, especially in Latin America, it is common to witness Internet access before basic telephone service is available (Richardson, 1998). Therefore, there is a certain amount of confidence in believing more people will be connected in the future; as Boldt (1997:10) says, "e-mail is not a luxury but a pure necessity."

Summary

The Internet was first developed for communication for military defence in case of a nuclear attack. Since then, virtually every type of actor in civil society has adopted the Internet to some extent though not every individual, organization or business has the luxury to implement and use it. There is substantial concern that it is the next tool in the series of tools (for example, Green Revolution, Structural Adjustment) which have

widened the gap between developing and developed countries. Yet it is one of the most fascinating forms of communication media and perhaps the most versatile. The NGO community has been creative in adapting to the force of the Internet and has been able to use it successfully. For some, the Internet has produced many benefits and for others it has done little. The most crucial aspect is the appropriateness of the technology and attendant training. However, one must remember that not everyone needs or wants to use the Internet and the design of this instrument must be locally adapted to the user.

Chapter Three

THE STUDY

Chapter Three describes the research methods used in the study on the use of the Internet with the Developing Countries Farm Radio Network. The methods were an on-line survey, on-line discussion and personal interviews. They related to the objectives of the study because they enabled a collection of both controlled responses (forced choice questions) and unrestricted responses (open-ended questions).

Data Collection

Two principal methods were used to alert members to the study. An introduction letter was created to introduce the study (purpose and objectives) and invited members to participate. The letter was e-mailed to members who listed an e-mail address in the database. It was also mailed to all members via regular mail.

Members who agreed to participate received an e-mail describing their involvement in the study. The first part was to complete a survey via e-mail. Instructions were provided on how to fill out the survey and send it back. The survey included a paragraph asking for consent to use the information they provided. Assurance of anonymity in the study was given. The survey was available in English, Spanish and French. The second part invited the participants to join an on-line discussion group created through *eGroups.com* (http://www.egroups.com).[4] Once members confirmed their interest to be a participant, an invitation to join the discussion group was sent to them via e-mail and they had the choice to either accept or decline the invitation. The discussion group was available in English, Spanish and French.

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[4] eGroups is a free e-mail group service where people can create and join e-mail groups.

A third part to the study was conducted in west-central Honduras. Personal interviews were employed. From the database, Honduran members were contacted by phone and were asked to participate in an interview. Depending on Internet access, approximately 12 to 15 questions were asked.

The fourth part to the study involved informal discussions with the Executive Director of DCFRN, Nancy Bennett and one staff member. Discussions took place with face-to-face meetings and through e-mail.

The nature of the survey questions can be loosely separated into seven areas. There were questions which sought to:

1) Characterize the respondents. Respondents were asked their gender, language, continent, organization or institution they work for and DCFRN classification;

2) Gather perceptions about the Internet. Respondents were asked what their general perceptions of the Internet were regarding access to information and communicating with other people;

3) Investigate what hardware and software applications were being used;

4) Establish how often they had access to the Internet the reason why they used the medium;

5) Identify the Internet information sources respondents used. Respondents were asked to list the top three websites they visited most frequently;

6) Explore the current state of communication between members and DCFRN and between members. Respondents were asked whether they had contacted or been in contact with other members and if they have ever contributed information to DCFRN. They were asked to identify incentives and barriers to their participation in a DCFRN on-line network and whether or not a member directory would be beneficial;

7) Identify potential components for the DCFRN website. Respondents were asked to state whether a certain component was beneficial or not necessary from a list of potential components. They were also given the chance to offer suggestions not listed.

The survey consisted of a combination of forced choice and open-ended questions. Forced choice questions were answered by selecting one or more of the answers provided. A space was provided to type the responses to the open-ended questions. The entire survey appears in Appendix 1. Responses to the survey were collected over a period of five months between January 31, 2000 and May 31, 2000.

The on-line discussion was important in answering the research questions because it provided a forum in which responses were not restricted to predetermined choices. This flexibility allowed an opportunity to gather new and/or different unbiased data because there was no influence from the study. The nature of the on-line discussion can be loosely separated into five areas. There were questions which sought to:

1) Gather perceptions about the Internet. Respondents were asked what their general perceptions of the Internet were regarding access to information and communicating with other people;

2) Describe "lessons-learned" from respondents' own experiences surrounding the Internet. Respondents were asked to share an experience that was considered unsuccessful and give reasons why. They were also asked if they learned anything from the experience;

3) Gather opinions on the role of DCFRN in producing, distributing and exchanging information. Respondents were asked how they felt about DCFRN as an organization in the business of producing, distributing and exchanging information;

4) Investigate perceptions on Radio and the Internet. Respondents were asked whether the Internet was seen as a replacement medium to the radio or as a complementary medium. They were also asked to share any experience they might have had with radio on the Internet;

5) Establish the level of training and education on the Internet. Respondents were asked if they have attended a workshop or course about the Internet or if they have taught a course themselves. They were also asked if they believe DCFRN should provide training materials to members of the organization.

The respondents received the on-line discussion questions through their e-mail. The respondents would click "reply" to answer the question. The on-line discussion questions appear in Appendix 2.

The personal interviews were designed to help answer the research questions. The opportunity to meet face-to-face with members provided rich data for the study. The nature of the personal interviews can be loosely separated into five areas. There were questions which sought to:

1) Characterize the respondents. Respondents were asked their profession, how long they have been a member of DCFRN and if they had access to the Internet;

2) Investigate the value of DCFRN material to them personally and to their organization. Respondents were asked about the uniqueness of DCFRN and how they used the material in their work;

3) Identify the information sources they employed in their work. Respondents were asked about the type of information and the form of media they received the information through;

4) Explore the use of the Internet. Respondents (if they had access) were asked what they used the Internet for, whom they communicated with electronically and if they used material from the Internet in their work;

5) Gather perceptions about the Internet. Respondents were asked what their general perceptions of the Internet were regarding access to information and communicating with other people.

The personal interview questions appear in Appendix 3.

The nature of the informal discussion with the Executive Director of DCFRN and staff can be identified in one loose area. The meta-categorical question sought to gather perceptions on how DCFRN might use and benefit from an Internet-based network. The informal discussion questions appear in Appendix 4.

Survey responses were sent to the study's e-mail (dcfrn_nmp@hotmail.com). Their personal information (name and e-mail address) was listed on the received survey but their identity was replaced with an identification code to ensure anonymity in the study. An identification code system was created to identify the three language groups. The code system is as follows: a) English surveys began with 10**, b) Spanish surveys began with 20** and c) French surveys began with 30**. This was done so that once the forced choice responses were separated from the open-ended responses for coding and analysis, it would be possible to match them up later.

Respondents were informed they would receive the results from the survey once the study was complete through *Voices*, the DCFRN newsletter and would be posted on the website.

On-line discussion responses were sent to each participant in the on-line discussion and submitted to the message board on the *eGroups.com* website (http://www.egroups.com/dcfrn_newmedia/dcfrn_nuevamedia/dcfrn_nouveaumedia). Respondents were not anonymous in the on-line discussion. Participants were identified by the names they chose when they accepted the invitation to join and were seen by other participants when they responded to a question or shared information. For the purpose of this paper, each participant was given an identification code. An identification code system was created to identify the three language groups. The code system is as follows: a) English on-line discussion respondents began with 50**, b) Spanish on-line discussion respondents began with 60** and c) French on-line discussion respondents began with 70**. This was done so they could be identified separate from the other forms of data collection in the study. Respondents were informed that they would receive results from

the on-line discussion once the study was complete through *Voices* and would be posted on the website.

The responses from the in-depth interviews have been kept confidential. The respondents were given an identification code. The code system identifies respondents from the in-depth interviews with a code beginning with 40**. Respondents were informed that they would receive results from the on-line discussion once the study was complete through *Voices* and would be posted on the website.

The responses from the informal discussion have not been kept confidential. The Executive Director and staff have been identified where their information is presented in the study.

Data Analysis

The responses to the forced choice questions were coded using a search and replace technique. A search and replace technique searches for a response and replaces it with a number. A codebook was created, replacing the responses with numbers to analyze the data. The analysis was performed on my laptop using the statistical software package SPSS.

Descriptive statistics were employed in the study because the statistics do not lend themselves to generalize from a sample to a wider population (as with inferential statistics which generalize from a sample to a wider population and in testing hypotheses) and do not test hypotheses (Foster, 1998). Descriptive statistics are used to describe sets of data. The purpose of descriptive statistics is to present information about a variable or the relationship between variables in a convenient, usable and understandable form (Elifson *et al.*, 1998). The scales of measurement are nominal and ordinal, which are

considered non-parametric and only can be used in descriptive statistics. Nominal scales are numbers used as labels for categories. They involve placing individuals or objects into categories. The categories must i) be homogeneous, ii) be mutually exclusive, iii) be exhaustive, and iv) make no assumption about ordered relationships between categories (Elifson *et al.*, 1998). Ordinal scales are categories where there is a rank-ordered series of relationships. The categories must i) be homogeneous, ii) be mutually exclusive, iii) be exhaustive, iv) and stand in some kind of relation to one another (Elifson *et al.*, 1998). The descriptive statistics procedures employed in this study were:

1. Frequency distributions created tables so that an overall picture of the data could be visualized and made counts of the data;

2. Cross-tabulations (basic non-parametric measures of association) examined the distribution of the categories of one variable under the differing conditions or categories of another. Contingency tables showed the cross-tabulation of two variables (Elifson *et al.*, 1998). Basically cross-tabulations examined how scores on two (or more) variables were related (Foster, 1998);

3. Chi-Square (for two-sample test) measured the independence of variables (two or more) not the association of variables. It compared the number of cases falling into each cell of a table with the frequency that would be expected if there were no association between the two variables that formed the table (Foster, 1998).

The Chi-Square test is only valid if three conditions are met. The first condition demands that the data be independent (respondents can only appear once). The second condition states that no cell should have an expected frequency of less than one. The final condition asserts that no more than 20 percent of the expected frequencies in the table can be less than five (Foster, 1998).

These methods were selected for four reasons. First, the methods were selected to find out if specified variables are completely independent from each other or perfectly related (cross-tabulation). Second, these approaches were adopted to measure the

independence of specified variables (chi-square). Third, to present the data in a clear, concise and understandable form so that it is possible to count and make basic assumptions of the data (frequency distributions). Fourth, these were the only methods that could be applied to the data because the data were non-parametric, descriptive and the sample size was small.

These methods were sufficient because they provided the information needed to characterize the respondents, to find out what software and hardware was used by respondents, why respondents used the Internet and how often they had access, the current level of communication between members and identified potential website components. Most of this information was presented and analyzed with frequency distributions.

Cross-tabulations and chi-square tests allowed for a more in-depth look into the data and provided another level of analysis. Cross-tabulations were used to find relationships between variables. The chi-square test of independence was also used to measures the degree of independence between several variables. It makes no assumptions about which one is the dependent or independent variable so it does not establish causality.

Qualitative research was employed for the following reasons:

1. The nature of the research problem was based on the perceptions and opinions of DCFRN members;
2. There was a need to illustrate or clarify some of the quantitative derived findings;
3. It was necessary to further explore the Internet phenomenon as the impacts and potential of this medium are little known (the Internet is still relatively new as the average consumer has used it for approximately five years);
4. To further study a group of people in an organization.

The method used to analyze the qualitative data was open coding which is a grounded theory procedure. Strauss and Corbin (1990) state that grounded theory is one that is inductively derived from the study of the phenomenon it represents. It is discovered, developed, and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon.

There are four central criteria for judging the applicability of theory to a phenomenon (Strauss and Corbin, 1990: 23):

1. Fit: If a theory is faithful to the everyday reality of the substantive area and carefully induced from diverse data, then it should fit that substantive area;

2. Understanding: Because it represents that reality, it should also be comprehensible and make sense both to the persons who were studied and to those practicing in that area;

3. Generality: If the data upon which it is based are comprehensive and the interpretations conceptual and broad, then the theory should be abstract enough and include sufficient variation to make it applicable to a variety of contexts related to that phenomenon;

4. Control: The theory should provide control with regard to action toward the phenomenon.

Grounded theory is a qualitative research method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon. The research findings constitute a theoretical formulation of the study rather than consisting of a set of numbers, or a group of loosely related themes. The purpose of grounded theory method is to build a theory that is faithful to the area under study (Strauss and Corbin, 1990).

There are four basic characteristics of grounded theory (Strauss and Corbin, 1990: 57):

1. It builds theory rather than only testing theory;
2. It gives the research process the rigor necessary to make the study "good science";
3. It helps the analyst break through the biases and assumptions brought to, and that can develop during, the research process;
4. It provides the grounding, builds the density and develops the sensitivity and integration needed to generate a rich tightly woven, explanatory theory that closely approximates the reality it represents.

There were three reasons why grounded theory was chosen. First, it has suggested hypotheses and recommendations for future research. Second, it lessened the potential biases and assumptions I brought as the researcher to this study. Third, it provided a clear picture on the feasibility of using the Internet in the Developing Countries Farm Radio Network.

In the survey, on-line discussion and personal interviews themes were identified in the open-ended questions. Some responses were lengthy and contained more than one theme. In this paper, themes are reported and illustrated by selected quotes. The responses to open-ended questions will be categorized according to these themes, following a procedure called *open coding* described by Strauss and Corbin (1990).

Open coding was used for naming and categorizing phenomena by closely examining the data. Open coding identifies the overall picture and is used to determine whether each document, posting or interview is the same or different from others. It is used to look for similarities or differences (Strauss and Corbin 1990). The sentences and/or paragraphs were examined using open coding to bring together major ideas. This same process was used in the on-line discussion and the personal interviews.

There were three main groups of qualitative data. They were the qualitative answers to the open-ended questions in the survey, the on-line discussion group and the personal interviews. In cases where the same question was asked in all three groups, the themes have been reported together. In cases where different questions were asked, themes were reported under the specified group heading. For example, one heading will be titled, "An analysis of the personal interviews." The information gathered from DCFRN was presented in a summary.

Data from all the respondents to the survey are reported in this paper. This was a total of 62 out of 247, or a response rate of 25 percent, who participated in the study. The scope of this paper has limited the responses to selected questions in the survey. The range and diversity of information collected by the survey prevents an attempt to report all the findings in this paper. The space of this paper is not adequate to allow for thorough reporting, discussion and exploration of the results from all questions. The findings of the study will continue to be analyzed and reported on the DCFRN website and in *Voices*.

Summary

This chapter introduced and explained the methods of research used in the study. There were both quantitative and qualitative methods chosen. The quantitative methods consisted of frequencies, cross-tabulations and chi-square tests. The qualitative methods included open coding from grounded theory and a short summary for the informal discussion with the staff at DCFRN. Due to the scope of the study, not all questions and responses were reported.

Chapter 4

FINDINGS

Description of the Sample

In this section, a description of the Developing Countries Farm Radio Network (DCFRN) member base is provided. The characteristics reported are active and inactive members, division by language, and e-mail address listings. Also in this section, a description of the respondents is given. The characteristics reported are member classification, continent of residence, primary language and gender.

As of July 26, 2000 the membership total of DCFRN was 1296. Out of this total, 1208 members were active (which means they are on the current mailing list for information packages), 51 members were inactive (they are not on the current mailing list but still in the database) and 37 members were unaccounted for.

The members are classified in the database by language. For example, someone who chose Spanish as their primary language is part of the "Spanish group" regardless of where they live. As of July 26, 2000 just over one-half of active members were English. Almost a one-quarter were classified as Spanish and the same for French.

As of July 26, 2000, a majority of members who had active e-mail addresses was the English group with 50 percent. The Spanish group had 39 percent of the active e-mail addresses and the French had 11 percent. The following table shows the number of listed e-mails in the database and divided the information by active and incorrect e-mail addresses.

Table 4.1 Members with E-mail

Language	Listed E-mails		Incorrect E-mails		Active E-mails	
	#	%	#	%	#	%
English	169	48.1	46	44.2	123	50.0
Spanish	138	39.3	42	40.4	96	38.9
French	44	12.5	16	15.4	28	11.3
Total	351	100	104	100	247	100

In the survey sample of 62 respondents, the largest proportion were radio broadcasters with 21 responses. Two member classifications were represented equally each with 12 responses which were extensionists and research/reference. Eleven repondents described themselves as teacher/classroom. One respondent did not answer.

The majority of respondents were from Latin America and the Caribbean (48 percent), with moderate representation from Asia (16 percent), Africa (15 percent) and slight representation from Europe and the Former Soviet Union (eight percent), North America (seven percent) and the Pacific (five percent). There were two (three percent) respondents who did not answer.

Thirty-one respondents reported Spanish as their primary language. There were twenty-five respondents whose primary language was English and six who reported French. Three-quarters of the respondents were male. The gender ratio was therefore 3:1.

Computer Resources

This section reports what the survey respondents are using to access the Internet. The hardware, software and connectivity to the Internet is described.

Three-quarters of respondents used a Pentium to access the Internet. Only one respondent used a Macintosh, three used a 486 or less and nine used a Pentium with other types of computers such as a Macintosh, 486, 386, Celeron and Jenor. There were three

respondents who did not answer. The most common type of software program used by respondents were Microsoft 95 and better (updated versions).

Table 4.2 Software

Computer Software	**Frequency**	**Percent**
Microsoft 95 & better	28	45.2
Microsoft & other programs	9	14.5
Word Perfect 7	4	6.5
Page Maker	2	3.2
Provided hardware not software information	5	8.1
Valid Total	48	77.4
No answer	9	14.5
Question not asked in survey	5	8.1
Total	62	100

Connectivity to the Internet was generally through a modem (78 percent). The most common type of modem used was 33k or less (40 percent), the 56k modem was used by 31 percent of respondents and five percent of the respondents could access the Internet either through a modem or Network LAN. Eighteen percent of respondents used a Network LAN and three percent used an Internet Café or other public areas to access the Internet. Three percent of respondents did not answer.

Use of the Internet

This section reports the respondents' use of the Internet. Described in this section are the use of e-mail in regular communication, access and connection to the Internet, reasons for lack of access and connection to the Internet, who used the medium and why the Internet was used.

Four-fifths of the respondents (79 percent) used e-mail and traditional media such as the telephone and fax in their daily communication. Sixteen percent of respondents

primarily used e-mail and five percent did not regularly use e-mail in their daily communication.

Almost all respondents (94 percent) had access to the Internet. Only four respondents did not; from those four, two reported they will have access to the Internet in the near future and the remaining two expect to have access to the Internet in the distant future.

The largest proportion (65 percent) of respondents had access to the Internet all the time. There were 19 respondents who had access to the Internet most times but not always and three respondents who had occasional access. Lack of connection (21 percent) was mainly due to the failure of the Internet service provider (ISP). One respondent reported that the high cost of the Internet service was the reason for the lack of connection and three stated it was due to both reasons identified above (ISP failure and high cost). Five respondents reported that they did not have constant access to the Internet but did not identify the reason for the lack of connection.

The largest proportion of respondents stated that all persons in their organization used the Internet. Please see the following table for further detail.

Table 4.3 Persons Using the Internet

Who used the Internet?	**Frequency**	**Percent**	**Cumulative Percent**
Director and staff	12	19.4	19.7
Director, staff and project officer(s)	9	14.5	34.4
Director, staff and researcher(s)	8	12.9	47.5
Director, staff, project officer, researcher	11	17.7	65.6
All the above and other (volunteers, audience)	18	29.0	95.1
One person organization	3	4.8	100
No answer	1	1.6	
Total	62	100	

The majority of the respondents (65 percent) used the Internet for both communication/information exchange (personal and work-related) and for knowledge accumulation (research and getting the latest news). One-quarter used the medium for communication/information exchange and three used it for knowledge accumulation. There were three respondents who did not answer.

Current State of Communication Between DCFRN and Members

This section reports the current state of communication between the Developing Countries Farm Radio Network and members of the organization. A description of how often respondents communicate with DCFRN and with each other is reported and whether or not respondents evaluated the information packages. Also in this section, incentives and barriers to participate on-line with DCFRN are identified and if members thought a member directory would be beneficial.

The largest number of respondents (45 percent) communicate with DCFRN approximately three to six times a year. Eleven percent of respondents communicated once a month or more with DCFRN, twelve percent of respondents communicated one to two times a year and seven percent of respondent have communicated once or not at all. There were eight respondents who did not answer.

Most respondents communicated with DCFRN when they were prompted by the organization. Those who communicated approximately three to six times a year were generally respondents who sent an evaluation of the information package they received. However, some communication centred around ideas or information for future scripts and to request information.

> *I would use it to evaluate scripts, provide ideas for future script, and update information.*
>
> *The times that I contacted the Network have been to ask for information. I also suggested adapting the website in Spanish since there are enough of those [members] in this language and seriously advised them to make a version in Spanish.*
>
> *...I have to admit that I haven't communicated by email, only asked if it would not be possible to send the packets by email and answer them in the same way because it would be much less expensive. Or put the packets online and leave it to the users to use them or not.*
>
> Comments from three respondents

Almost half of the respondents have sent an evaluation of an information package by Infopoll, which is a one page paper-based survey that accompanies each script package. Only six respondents have actually sent an evaluation of the information package by e-mail.

Table 4.4 Evaluation of Scripts by Infopoll and E-mail

Infopoll	Frequency	Percent	E-mail	Frequency	Percent
Yes	29	46.8	**Yes**	6	9.7
No	23	37.1	**No**	39	62.9
Total	52	83.9	**Total**	45	72.6
No answer	10	16.1	**No answer**	17	27.4
Total	62	100	**Total**	62	100

Over half of the respondents (55 percent) reported that they have not contributed information or ideas to DCFRN for future information packages. Twenty-three respondents have contributed information in the past and five did not answer. The types of information that respondents reported contributing to DCFRN were:

- Agricultural extension information;
- Entomology and organic agriculture;
- Cultural health;
- Capacity Evaluation;
- Environmental information.

More than three-quarters of respondents have never contacted another member or have been contacted by a member and have never made indirect contact with another member via DCFRN.

Table 4.5 Communication Between Respondents and Members

	Contact with Members (Respondents Initiative) Frequency	%	**Contacted by a Member Frequency**	%	**Indirect Contact with Members (via DCFRN office) Frequency**	%
Yes	11	17.7	9	14.5	7	11.3
No	47	75.8	49	79.0	50	80.6
Valid Total	58	93.5	58	93.5	57	91.9
No answer	4	6.5	4	6.5	5	8.1
Total	62	100	62	100	62	100

Almost one-quarter (24 percent) of respondents stated that information exchange (which includes access to DCFRN information and providing information to DCFRN and other members) was an incentive to participate in an on-line network. There were three respondents who reported that communication with other members was an incentive. However, the majority (63 percent) of respondents reported that both information exchange and communication with other members were incentives to participate in an on-line network. There were five respondents who did not answer.

Over half (36 respondents) reported that lack of time would be the main barrier to participation in an on-line network. Six respondents stated that little or lack of resources and access and little use of DCFRN material were what would prevent them from participating. Fourteen respondents did not answer.

An overwhelming number of respondents (79 percent) noted that a member directory would be beneficial for each member. Seven percent reported that it would not be beneficial and 15 percent of respondents did not answer.

> *It [member directory] will keep members aware of who they can share and exchange information and materials, and also use as a reference.*
>
> *...so that if possible we can communicate to each other directly on issues affecting each one of us. It would be easier to contact the individual member than going through the Network which may take time.*
>
> *In our case we hardly know of any members of the Network, which is the primary reason for us not contacting them. Since we have also never received any correspondence from any other member, I think the problem is mutual. A directory would greatly facilitate communication and many other issues than those covered in Voices or the scripts may also be discussed.*
>
> Comments from three respondents

Almost three-quarters (74 percent) of respondents believed that the member directory should be on the DCFRN website, ten respondents did not want the member directory on the website and six respondents did not answer.

> *It would be convenient and might encourage spontaneous interaction.*
>
> *It would allow us to locate any member simply by visiting the website of the Network. We suggest that in the directory each member should have information on what they work in so that we could share similar experiences.*
>
> Comments from two respondents

An overwhelming proportion of respondents (87 percent) gave their permission to be published in the member directory and eight respondents did not answer.

Potential Components for the DCFRN Website

This section reports possible new elements and/or services for the DCFRN website. The results having an on-line reference library of past scripts, the latest information package posted, latest *Voices*, latest news section, a members only section, a facilitated discussion, an unfacilitated discussion, an evaluation panel and an information panel are described.

Table 4.6 Possible World Wide Web and/or E-mail Components

Idea	Beneficial		Not Necessary		No Answer		Not Listed (in survey)*		Total	
	#	%	#	%	#	%	#	%	#	%
Reference Library of Past Scripts	51	82	2	3	9	15	0	0	62	100
Latest Information Package Posted	52	84	2	3	8	13	0	0	62	100
Latest *Voices*, the Newsletter Posted	50	81	2	3	10	16	0	0	62	100
Emergency or Latest News Section	15	24	5	8	12	19	30	48	62	100
Members Only Section (M.O.S)	3	5	9	15	15	24	35	57	62	100
MOS –Member Directory	38	61	6	10	18	29	0	0	62	100
MOS- Facilitated Discussion	35	57	5	8	22	36	0	0	62	100
MOS- Unfacilitated Discussion	5	8	14	23	43	69	0	0	62	100
MOS- Evaluation Panel	37	60	6	10	19	31	0	0	62	100
Information Panel (to provide info to DCFRN)	41	66	2	3	19	31	0	0	62	100

*Note: Two ideas (emergency or latest news section and members only section) were deleted from the Spanish and French on-line survey. Therefore the statistics do not realistically reflect member input.

Respondents' Use of Internet Information Resources

With regard to respondents' use of websites, the most popular sites were the Food and Agriculture Organisation of the United Nations (FAO) (http://www.fao.org/) (identified six times), the Educational Concerns for Hunger Organization (ECHO)

(http://www.echonet.org) (identified twice), the International Development Research Centre (IDRC) (http://www.idrc.ca) (identified twice) and Oneworld (http://www.oneworld.org) (identified twice). Two search engines sites were identified by respondents which were Altavista (http://www.altavista.com) (identified four times) and Yahoo (http://www.yahoo.com) (identified three times). The following table identifies the websites and their perceived value to respondents.

Table 4.7 Member Suggested URLs

Name	**URL Address**	**Reason why visited (comments by respondents)**
Indev	http://www.indev.nic.in	News on India, supply NGO sector.
Sustainable Development Gateway	http://sdgateway.net	Development news and features
UCDAVIS Site	http://vric.ucdavis.edu	Information on sustainable Agriculture, tropical plant databases.
Russian Rural Information Network Project:	http://www.fadr.msu.ru	Unique and actual information about agriculture. On-line agricultural discussion group and marketing system. Library and catalogues that are professionally done and have useful information.
Ministry of Agriculture of the Russian Federation	http://www.aris.ru	Good information on State statistics and analytical articles. Easy access to departmental information. Lots of useful databases that can be used by researchers and practicians.
Rural Advisory Centers	http://www.rcc.nnov.ru/	They are brave enough to start to develop on-line consulting service for their clients. On-line bulletin and other information is very useful to all Network Members in Russia.
University of Florida	http://edis.ifas.ufl.edu/	Quick access to useful tropical/subtropical fact sheets which can be printed out or read online.
ECHO (Educational Concerns for Hunger Organization)	http://www.echonet.org	In my opinion they are concerned to distribute really practical, "down to earth" contents, "experiences"! In this sense also a quite good selection of publications and the best: they send also samples of seeds; the "genetic information" also and not only the "theoretical one"
IDRC	http://www.idrc.ca	They send me an email weekly with article summaries and links to articles on their website. I frequently find a summary which I want to know more about, so I visit their site and read it.
Secretaria Pro Tempore	http://www.spt-tca.org	I work mainly in the Spanish speaking part of Amazonia; on the website one can find more than 40 books published online (printable in

		chapters or as a whole) which are in my opinion a quite recent source of information (p.e. descriptions of plants with some picutures...); most of them are not so praxis-orientaded as I would wish to, but anyway: they are a big step where there was very little before.
Oneworld	http://www.oneworld.org	Lots of links, searchable – very often the "beginning point" for further "surfing".
United Nations Economic Social Commision for Asia and the Pacific (ESCAP):	http://www.unescap.org/	Directly relate to our office. ESCAP Pacific Operations Centre is a field office of UN ESCAP. Access update activity programmes and latest happenings and developments within the organization.
United Nations Secretariat	http://www.un.org/	Access update information and news on UN activities and development programme. Also access general information on and about the UN, its functions and activities for responsive purposes for the seek of our clients and/or community members
International Monetary Fund:	http://www.imf.org/	To access information and publication materials for technical advisory purposes (ESCAP/POC staff and consultants) and our reference library.
Food and Agriculture Organisation of the United Nations	http://www.fao.org/	It has all the information sustainable agricultural development and has linkages to many useful websites dealing with agricultural issues.
CASS/PLASS CBNRN PROGRAMME	http://www.cbnrm.uwc.ac.za	It has useful information on land development and other related issues which form pillar of our work at this organisation.
CTA	http://www.cta.nl	This website has all the useful information affecting agricultural developments in ACP countries and has contribution from many networking partners around the world. Its information is very relevant to the work we are doing at my organisation.
Economist	http://www.economist.com	This keeps me up to date with world politics and business affairs – in the absence of a reliable local service.
CAB International	http://www.cab	No answer.
KISAN	http://www.kisan.net	Indian agriculture, indigenous practices, organic farming.
Sustainable Practices for Vegetable Production in the South	http://www.cals.ncsu.edu/sustainable/peet/other.html	Directory of sites on aspects of sustainable agriculture.
Global Ecovillage Network	http://www.gaia.org	Relevant to our work.
Asian Vegetable Research and Development Center (AVRDC)	http://www.avrdc.org.tw	This (our) site is mostly of value to agricultural researchers, but it is being improved regularly with new information of use to educators and extentionists.

International Service for National Agricultural Research (ISNAR)	http://www.cgiar.org/isnar/	This site has good training materials, for downloading free of charge.
Java Boutique	http://javaboutique.internet.com/	It's a good resource for people who want to incorporate java into their websites.
US Environmental Protection Agency		Environmental information.
Federal Emergency Management Administration.		Disaster mitigation information.
Laneta	http://www.laneta.apc.org	It is a service where you can find many civil organizations of Mexico. It allows us to know about the events and our relationship with them.
Explora Mexico Salud	http://www.explore-mex.com/salud/	It contains data and updated news on health.
CNN.com	http://www.cnn.com	Actual news.
Fidamerica	http://www.fidamerica.com	Conferences
Associazione Laicale Ecuaristica Riparatrice	http://www.aler.com	Valuable experiences of communication.
Fundacion Neo-Humanista – Colombia	http://neo-humanista.org	A variety of information on facilitation. Good links. I have some articles of mine in the virtual library.
Red de Desarollo Rural Sostenible – SDN – Nicaragua.	http://www.sdnic.org.ni	Each time it has many themes of interest for the country I work in at the moment -Nicaragua.
Altavista	http://altavista.com	Because any type of information can be found.
Yahoo	http://yahoo.com	Because it is possible to obtain diverse information.
Satnet	http://satnet.net	Because it is a route where it is possible to find important national information.
Secretaria de Agricultura Ganaderia y Desarrollo Rural.	http://ww.sagar.gob.mx	Access to the federal government institutions that are involved with agriculture.
United States Government	http://www.usda.gov	A good deal of information.
Geocities	http://www.geocities.com	Cultural investigations.
Buscador YUPI.	http://www.yupi.com	Because it is in Spanish and it has a good search engine where I can access a variety of information when I do not have the specific [URL] address.
Hispavista	http://www.hispavista.com	It is a good finder of resources.
Rede de Informacion do Terceiro Setor.	http://www.rits.com.br	There is a lot of information for NGOs.
Cfemea	http://www.cfemea.org.br	Information on the rights of women (laws and political lobbying).
Rede Mulher de Educacion	http://www.redemulher.org.br	Our website contains important information about the fight for women.
El Nacional	http://www.el-nacional.com	News and reports on Venezuela
AMARC (World	http://www.amarc.org	Contacts and information on community radio.

Association of Community Radio Broadcasters)		
Information for Development in the 21st Century	http://www.id21.org	Actual information on development. I like the perspective.
FUNDACYT	http://www.fundacyt.org	Technical information.
UNESCO	http://www.unesco.org	For the variety of themes.
Folklore de Norte Argentino	http://www.flockloredelnorte.com.ar	Indigenous culture.
Literatura.com	http://www.literatura.org	Literary selections.
Sistema de Informacion para Comunidades y Municipios (SISCOM).	http://www.siscom.or.cr	Participation and local development in Central America.
Association for Progressive Communication	http://www.apc.org	Interest in a variety of themes.
Nodo Nicarao	http://www.nicarao.org.ni/www.apc.org	Interest in a variety of themes.
Panos	http://www.panos.sn	Our site with a lot of information on the media in Africa.
National Program in technology transfer in agriculture.	http://www.agriculture.ovh.org	It is my website.

Cross-tabulations

This section reports findings from cross-tabulation tests. It includes cross-tabulations with member classification, continent of residence, primary language, gender and two tests that involve only dependent variables.

There was equal or almost equal representation of respondents who contributed and did not contribute information to DCFRN in the extensionist (50 percent), research/reference (40 percent), and teacher/classroom (45 percent) categories. Slightly more than a quarter of radio broadcasters (26 percent) contributed information.

Table 4.8 Member Classification / Contribution of Information to DCFRN Cross-tabulation

		Contribution of Information to DCFRN		**Total**
		Yes	No	
Member Classification	RB: Radio Broadcaster	5	14	19
	EX: Extensionist	8	8	16
	REF: Research/Reference	4	6	10
	OM: Teacher/Classroom	5	6	11
	Unclassified	1	0	1
Total		23	34	57

The majority of respondents from each continent used the Internet for both communication and information exchange and for knowledge accumulation – 75 percent in North America, 72 percent in Latin America, 60 percent in Europe and Former Soviet Union, 43 percent in Asia, 66 percent in the Pacific and in Africa. However, only three respondents used it for knowledge accumulation and they were located in Latin America. This finding indicates that the use of the Internet was predominantly used for communication and information exchange.

Respondents from North America and the Pacific had continuous access to the Internet while the respondents from other continents reported a range of access from occasionally to continuously. Two-thirds of the respondents from Latin America had access all the time while the remaining one-third had access most times but not always. There were 60 percent of respondents from Europe and the Former Soviet Union who had continuous access to the Internet, 20 percent had access most times but not always and the remaining 20 percent had access occasionally. Only 11 percent of respondents from Asia and Africa had continuous access while the majority (77 percent) had access most times but not always.

Respondents from North America were the only respondents to state that it was not very important to send the scripts and *Voices* as efficiently as possible. Three-quarters reported that it was somewhat important. Only one respondent from Europe and the Former Soviet Union felt that it was very important. A large proportion of respondents in the remaining categories, Latin America (approximately two-thirds), Asia (55 percent), Africa (78 percent) declared that it was very important to send the scripts and *Voices* as efficiently as possible. Respondents from the Pacific were equally varied between very important, somewhat important and not too important with approximately one-third in each category.

Although the majority of respondents indicated that they had not visited the DCFRN website, more English-language respondents (40 percent) had visited the website compared to Spanish (20 percent) and French (17 percent) respondents. The website is offered in two languages, English and French. Almost all female respondents (except for one) maintained a library of past scripts whereas a large number of males (42 percent) did not maintain a library. More male respondents (40 percent) have contributed information to DCFRN compared to female respondents where only 31 percent have contributed information. No female respondents reported communication with DCFRN on a regular basis and only half of female and male respondents communicated when they received the script package.

Table 4.9 Gender / Communication with DCFRN Cross-tabulation

		Communication with DCFRN				Total
		1 time/month or more (regularly)	3 to 6 times/year (when I receive script package)	1 to 2 times/year (occasionally)	1 time or never (rarely or never)	
Gender	Female	0	9	3	2	14
	Male	7	19	9	5	40
Total		7	28	12	7	54

Respondents who communicated regularly contributed the most information to DCFRN. Respondents who communicated approximately three to six times a year more than likely sent an evaluation on script material since they communicated only when they received a script package.

Table 4.10 Communication with DCFRN / Contribution of Information to DCFRN Cross-tabulation

		Contribution of Information to DCFRN		Total
		Yes	No	
Communication with DCFRN	1 time/month or more (regularly)	5	2	7
	3 to 6 times/year (when I receive script package)	14	14	28
	1 to 2 times/year (occasionally)	3	9	12
	1 time or never (rarely or never)	1	5	6
Total		23	30	53

Three-quarters of the respondents considered that their use of the Internet in their daily lives was an incentive to participate in a DCFRN on-line network.

Table 4.11 Use of the Internet / Incentives to Participate On-line Cross-tabulation

		Incentives to Participate On-line			**Total**
		Information Exchange (access to DCFRN & providing information to members & DCFRN)	Communication with Members	Both	
Use of the Internet	Communication/ Information Exchange (personal & work related)	4	2	10	16
	Knowledge Accumulation (research/getting news)	2	0	1	3
	Both	9	0	27	36
Total		15	2	38	55

Measure of Independence – Chi-Square

This section reports valid chi-square tests and whether two or more variables were independent or not. This test does not look for the causative effect between two variables because the chi-square test does not distinguish between independent and dependent variables. Following are the findings:

- The chi-square test between primary language and the possibility to download scripts on-line was valid but not significant;
- The chi-square test between gender and evaluation of scripts by Infopoll and contribution of information to DCFRN were valid but not significant;
- Only one test indicated that two variables were independent and this was whether or not females and males differed in maintaining a library of past scripts. The sample size of females was 16 and the sample size of males was 46. The entire sample size was 62. The probability was 0.08 (using a ten percent significance level) which indicated that females and males did differ on whether a library of past scripts was maintained. Females maintained a library of past scripts more than males.

Open Coding of Qualitative Data

There were three major questions answered through the open-coding technique of grounded theory. These three questions concerned the general perception of the Internet, the most valuable e-mail respondents ever received and the potential role of the Internet for the Developing Countries Farm Radio Network.

General Perception of the Internet

The four main themes identified in this section were:

1. Information Platform;
2. Communication Facilitator;
3. Information Skyway;
4. Individual Productivity Effects.

There were 100 responses open coded which included responses from the open-ended questions in the survey, the on-line discussion and the interviews.

Information Platform

A variety of attributes were identified in this category. There are five attribute groups and are in ascending order. For example, the first attribute Information Provider was mentioned the most by respondents. They were Information Provider, Educator, Information Overload, Information Exchange and Internet Know-How. Although distinct, the attributes are related. An example of the relationship between attributes is Information Provider can lead to the role of an Educator. Although interrelated, the attributes were kept distinct to preserve the details of the responses. What follows is an explanation of these attributes and a discussion of the responses that were included in them.

1. Information Provider

Out of 100 open coded responses, 33 percent identified that one aspect of the Internet was access to information. The medium provided both mainstream and alternative information, some of which was not shown in regular press or news. The multitude of topics available was extensive and respondents felt they could at least find part of what they were looking for on the Internet before researching other information resources. The Internet was heralded for the diversity of information that could not be found elsewhere as well as its independence from physical locations. If respondents had access to the Internet at home or in the office, they did not need to physically go to a library or resource centre to find information. Additionally, the ability to access the same information (such as a specific website address) could be done with relatively more ease than attempting to locate the same information through other resources. A respondent from Nicaragua would be more likely to have access to different information resources compared to a respondent from India even if they were looking for information on the same topic.

> *... In addition, I must point out that it [Internet] is a service that keeps us informed worldwide in all the fields: art, culture, sports, politics, technology, etc... in the present time.*
>
> *Internet is good for me because I don't have to move from my office [respondent relies on crutches to walk], I don't have to go to any library or bookstore.*
>
> Comments from two respondents

The Internet was seen as a diverse, alternative information resource. It provided respondents with up-to-date information in various fields, some of which were not available with other traditional information resources such as the library or bookstore.

2. Educator

Out of 100 open coded responses, almost one-quarter of respondents pointed to the educational value of the Internet. People learn continuously and learning occurs in formal and non-formal ways. The Internet provided an opportunity to learn about topics in a vast number of fields, disciplines and personal interest topics and allowed for agile attainment of the information. Respondents could find just about anything they wish to learn about on the Internet. As one respondent stated, "there is a huge pool of untapped resources available on the Internet." The development of skills and activities has increased because of connectivity and the new level of expertise was enjoyed not only by respondents but also by their workplace.

> *It [Internet] encourages you to explore new ideas and search for answers to questions and problems by sharing your difficulties with other people.*
>
> *Electronic mail has been very useful to share and obtain information, share experiences, knowledge and to have new learnings.*
>
> Comments from two respondents

3. Information Overload

Again, almost one-quarter of responses identified that one characteristic of the Internet was the amount of irrelevant information received. Owing to the immense amount of information on the World Wide Web, some respondents found it difficult to find relevant information. Respondents must maneuver their way through quite a bit of information before the desired information was found. It was possible to find relevant information in a short period of time but this was a chance one must take when deciding to seek information on the WWW.

Internet - huge potential but still more frustrating than anything else: it takes ages to look for information and then it often isn't there!

...In fact, I do not explore it [Internet] too much. It seems to me that there is information at the general level but little in concrete experiences of work in rural communities which are the subject of my interest.

Comments from two respondents

When information was found on the Internet, respondents had to make an additional effort to ensure the validity and credibility of the source of the information. Unlike printed material, such as a book or journal, information published on the Internet did not have to adhere to the laws of referencing and proper sourcing of material. Some respondents were aware that extra steps must be taken to verify information. The respondents felt that unreliable information could lead to mis-education and this was a disadvantage for anyone who received information from the Internet.

Unique tools which can increase and speed access to information, but not 100% reliable, both in technology and quality of information available. I greatly enjoy the ability to research a topic at any hour of any day. However, one must still take pains to ensure that the information received comes from trustworthy sources.

Comment from one respondent

The amount of information available on the WWW was so abundant that there was, at times, too much information. For example, when a key word is typed into a search engine, the number of results could be in the thousands. By March 2000, there were just over one billion published web pages on the World Wide Web and the number was expected to double eight to twelve months from then (CFNY, 2000). Respondents believed that the WWW has become a world of its own and they must learn how to properly seek information in order to benefit from it.

It [Internet] creates more problems than it helps to solve when the amount of "information" is so big that one cannot "digest it."

...However it [WWW and e-mail] also increase the demands on my time with the increase in volume of public inquiries and information being received.

Comments from two respondents

4. Information Exchange

Twenty percent recognized that one feature of the Internet was the ability to exchange of information. The ease to ask and give information was noted and respondents stated that at times people sent good ideas and tips that were helpful in their work. Two benefits as mentioned by respondents with regard to e-mail were the speed at which information was exchanged and the low cost to send information. The ability to access information worldwide without excessive expenses was observed.

To exchange information at least time and cost. It [e-mail] is practically the fastest way of communication. It is a very good media for day to day life of communication.

Comment from one respondent

For respondents the Internet provided an alternative means to distribute information. Information can be published at any time and can be updated to the second. This speed allowed for rapid up-to-date retrieval and was identified by respondents as a potential asset for the Developing Countries Farm Radio Network.

...We also have a WWW site and use listserver software to automate information distribution. And e-mail is convenient for sending large files as attachments, so it's become a part of our publishing workflow.

Comment from one respondent

5. Internet Know-How

Fifteen percent of respondents reported that a user needed to know how to use the WWW for it to be beneficial. Respondents stated that the medium was a great information resource when one knew how to "surf" properly. However, there was general concurrence among respondents about the difficulty in finding information and the potential for the WWW to become a comprehensive resource was therefore stifled. One respondent felt that the medium only provided information at the general level but little in concrete experiences of work in rural communities. Another reported that the WWW was of little use but that e-mail at least provided a way to receive bibliographies and potted news. Due to the lack of Internet know-how, the medium was being used at a beginner's level for information research.

> *There is a need for guides to the Internet because when too much information is retrieved it can be frustrating trying to pick out the most relevant information.*
>
> *It is relatively easy to buy a computer and "install" the software but it still needs a good amount of time to get used to the tool and be able to use it for the best communication, not as a toy.*
>
> Comments from two respondents

Respondents reported losing valuable time researching on the WWW because of the amount of time needed to sift through the results to find the right information. This was a deterrent in using the medium as an information resource. Additionally, respondents enjoyed the opportunity to make contact with the publishers of a website when an e-mail address was provided but were disheartened when the publishers were not willing to respond to requests and inquiries. The lack of contact became a deterrent to use the Internet for further research or to make contacts.

Well sometimes I write some organizations to solicit information from them but not always people answer you. If they put their e-mail [on the website] I think they have to answer you.

My personal experience has been that there is a lot of information floating around still unutilised. The problem is that information on simple, practical and inexpensive solutions to farming is rarely in format that is accessible to the resource-poor, often illiterate farm families.

Comments from two respondents

Communication Facilitator

A variety of attributes were identified in this category. The attributes were grouped into three categories and are in ascending order. They were Network Promoter, Contact Enabler and Relationship Builder. Although distinct, the attributes are related. An example of the relationship between attributes is Contact Enabler can lead to the creation of a relationship, Relationship Builder. Even though interrelated, the attributes were kept distinct to preserve the details of the responses. What follows is an explanation of these attributes and a discussion of the responses that were included in them.

1. Network Promoter

About one-third of the respondents reported that the Internet provided an opportunity to create and maintain information networks. Respondents felt that the medium was conducive in promoting solidarity action through establishing and maintaining contacts and relationships. As one respondent stated, "a network is a source of talents, experiences and excellent practices of how to solve problems regularly faced by social entrepreneurs." The WWW and e-mail were tools to network with other NGO's, institutions and donors especially with an opportunity to exchange experiences, development approaches and educational material. The Internet was a space to share

ideas and socialize them and respondents believed new projects could arise from combining the experiences of members from diverse points of the planet. Geography was eliminated as a deterrent to create international networks as a respondent reported the Internet "is a resource that breaks borders."

> *...In addition, I am enrolled in several distribution lists or exchange, where I participate. This gives me access to information, new contacts and it allows me to be in touch with people around the world on the topics that interest me.*
>
> *General perceptions on electronic mail and the Internet: I believe that they are two fundamental tools for the fluid communication in these days of globalization. Today we must be "speaking" with people anywhere in the world and informed into whatever occurs on the planet.*
>
> Comments from two respondents

Respondents believed that networks supported the acquisition of knowledge, education and rural development because people could expand their knowledge base and had more contacts with those who could help them in their work. There was strong support from respondents to find out who other members were and their area of expertise. Many respondents were curious as to the lessons learned and best experiences of other members and felt a network could provide a forum for this exchange.

> *We increasingly utilize the Internet as a means of communicating with individuals and organizations that are collaborating with us in developing drafts of publications (books and newsletters).*
>
> *In my opinion, I think it would be a good thing to set up this organization [on the Internet] because to place a great number of capital information at our disposal would only reinforce our links and facilitate our efforts of development in our respective areas.*
>
> Comments from two respondents

2. Contact Enabler

One-quarter felt that the Internet enabled them to contact people who had access to the medium. The respondents stated that the WWW and e-mail (primarily e-mail) allowed them to make contacts they would not have necessarily made had it not been for the media. One respondent reported that e-mail had become a vital means of communication especially with people whom the respondent did not personally know. The respondent benefited from information discussed on listservs and enjoyed pursuing new contacts that could possibly benefit the respondents work. Additionally, respondents were aware of the relatively low cost of using the Internet to pursue, establish and maintain contacts compared to other means of communication such as the telephone or fax.

> *I can prospect new contacts (customers, providers, partners) at a cost being worth between 10 to 30 times less expensive than with the means which were accessible before (in particular, fax).*
>
> *I think that this tool [WWW and e-mail] is a chance to discuss with people who are not on the same continent as us. To initially have contacts with people on their activities and then if required to share resources on all the possible and conceivable topics.*
>
> Comments from two respondents

Respondents reported that the medium provided an opportunity to those who were naturally shy to overcome the initial fear of face-to-face or voice-to-voice contact. One respondent stated that "on-line conferences and chats allow people to express their ideas and thoughts without being frightened by all means." E-mail was a more informal way to write someone compared to the formality of a letter and therefore tended to write more and made contact with a larger group of individuals. The informality of e-mail allowed

respondents to feel comfortable without the fear or burden of preparing a letter or fax. A respondent declared the relationship with fellow NGOs and donors was strong because they maintained informal and friendly relationships through e-mail.

> *It [e-mail] is the quickest and most efficient mode of communication. In terms of communicating with others: It got me around writing letters. Very quick and practical.*
>
> Comment from one respondent

3. Relationship Builder

With regard to creating and maintaining relationships, both professional and personal, 14 percent of respondents agreed. Respondents reported that due to the speed at which they could communicate, primarily with e-mail, compared to traditional media such as the mail, the contacts and relationships had more of a chance to remain active and have less chance to go stale due to the passing of time and forgetfulness. It was noted that the medium facilitated relationships in partnerships and mutual activities due to the relative ease of establishing contacts in a time-efficient manner and generally with a lower cost. As one respondent stated, "I consider that Internet is a very useful tool that allows us to maintain contact and exchange information with any person and institution with minimum cost." Additionally, it was evident that respondents benefited personally from the medium as they experienced a higher degree of building and maintaining relationships with family and friends, especially when family and friends were dispersed geographically.

> *...and on a personal level, that it [e-mail] enormously facilitates communications with family and friends scattered all over the world.*
>
> Comment from one respondent

Information Skyway

In this category, two attributes (Capital Dependent and Increased the Digital Divide) were grouped. Although distinct, the two attributes are related. For example, the attribute of Capital Dependent can be a factor in enhancing the gap between the 'haves' and the 'have-nots', Increased the Digital Divide. Although interrelated, the two attributes were kept distinct to preserve the details of the responses.

The concept "Information Skyway" was used to describe this section. It replaces the concept "Information highway" because the Internet is similar to flying in the air at a fast speed. Only those who can afford to fly use the Internet. Additionally, the technology changes so rapidly that it might not be possible to find what one looks for due to the speed at which he/she is traveling. What follows is an explanation of these categories and a discussion of the responses that were included in them.

> ...one cannot use only Internet and think of reaching all the social layers. It is still thus reserved for a certain social class in certain countries.
>
> Comment from one respondent

1. Capital Dependent

Approximately one-third of the respondents felt that one aspect of the Internet was the necessity for financial resources. Several stated that the Internet would be beneficial provided there were funds, resources, infrastructure and access to all. In order to take advantage of this medium it was necessary to have financial resources.

Respondents reported that it was possible to have access to the Interent at the grassroots level; however, generally computers and access were available only in offices or Internet cafés. Individual ownership and access were less common. One respondent

felt that he was fortunate enough to have access through the resources provided by his workplace. The respondent went on to say that on a personal basis the Internet was still too expensive to afford.

> *In terms of communicating with people: [the WWW and e-mail are] a great tool when dealing with those with access to technology. In Africa, however, where most people do not have access to the Internet, intermediaries have to be used but costs will have to come down.*
>
> *During this modern age I feel it is vitally essential for rural agents and workers to be equipped with such technology. For most of us in the Third World, especially in the least developed countries like Vanuatu, the majority of individuals cannot afford to be personally connected to the e-mail/Internet network.*
>
> Comments from two respondents

2. Increased the Digital Divide

Thirteen percent felt that the Internet helped to increase the "digital divide" between those who have access and those who do not have access to technology.

> *So far all proponents of electronic communication seem to assume that access – IN DEVELOPING COUNTRIES – to electronic communication in these is as easy as it is for us in the industrialized world. IT IS NOT in all DC's [developing countries]. It may become so as time passes. Last year I sat at a conference with a Ugandan who described the 'status' attached to having a computer with web access on the boss' desk – he is a boss.*
>
> Comment from one respondent

Another aspect identified by respondents was the domination of the English language on the Internet fed the digital divide. One respondent reported that the Internet was an excellent tool for global communication, especially with access to interesting experiences from diverse points of the world, but was aware that the medium was of

limited value because it was dominated by the language. Another respondent stated that she was frustrated with the Internet as an information resource because of this factor.

Some respondents were aware that only those who had financial resources contributed much of the information published on the Internet and that marginalized people and other civil society actors could not afford to be represented.

> *Although improving, I noticed that there is still a barrier to use listservs or to participate in electronic conferences on the part of rural farmer organizations, NGOs and other organizations of civil society. There are cultural, economic, [and] structural barriers that exclude many organizations and people. Even the information on the Internet is by organizations who, in general have easy access to this service and the information and opinions of most rural and social organizations are not represented on the Internet.*
>
> Comment from one respondent

Individual Productivity Effects

Four attributes were grouped in ascending order. They were Time Saver, Money Saver, Time Waster and Work Productivity Enhancer. Although distinct, the attributes are related. An example of the relationship between attributes is Time Saver can enhance the productivity of someone's job, Work Productivity Enhancer. Although interrelated, attributes were kept distinct to preserve the details of the responses. What follows is an explanation of these categories and a discussion of the responses that were included in them.

1. Time Saver

Almost half of the respondents observed that the Internet saved time in communicating with others (e-mail) and providing information (WWW and e-mail). The media was considered a great breakthrough in ensuring a "speedy and cost-effective

means of accessing, sharing and exchanging information." Additionally, in countries where mail is slow, e-mail has provided an opportunity to become independent from the mail system. As one respondent reported, a letter can sometimes take up to two months to reach its destination.

> *E-mail makes communication efficient and quick. In a country where conventional mail works very slowly, e-mail is the best alternative.*
>
> Comment from one respondent

Respondents also felt that the Internet was a good resource to find general information when time was a factor. As almost anything could be found on the WWW, it was possible to receive information at a short notice. One respondent stated that whenever there was an emergency in terms of needing information for a report or a meeting, the medium was the first to be consulted.

2. Money Saver

Fewer than one-quarter were of the view that the Internet saved money. Respondents reported that the medium provided an alternative source to disseminate information at a lower cost compared to traditional means of delivering information such as mail. Those who had access to the Internet were given the chance to access information that could not be accessed previously owing their dependency on newspapers, journals, television, radio, bookstores, libraries and other sources of information. The Internet provided opportunity for respondents to access information from the comfort of their own office or home without excessive expenses.

3. Time Waster

Fewer than one in five commented that the Internet wasted time. Although respondents stated that the medium saved time, it was also mentioned that it wasted time. There were two apparent contributors to this paradox. First, it was felt that it took a great deal of time to find relevant information on the WWW. In conjunction with the first point, depending on the technological resources, the Internet service was extremely slow. Second, the number of e-mails received, postings made on web-boards and chat rooms have increased the amount of time needed to read, respond and participate on-line.

> *Absorbs a lot of time – it can take away the time needed for other responsibilities and practical work like working with the farmers. I hope the benefits from the Internet will outweigh this potential problem*
>
> *I have spent entire days on the Internet and it did not serve me much. I did not find the information I was looking for. Perhaps I look for things that are not yet on the Internet.*
>
> *However, it [e-mail] also increase the demands on my time with the increase in volume of public inquiries and information being received.*
>
> Comments from three respondents

4. Work Productivity Enhancer

Thirteen percent reported that the Internet enhanced productivity at work. Respondents felt that the medium increased the productivity of employment and provided more flexibility. It took less time to communicate with individuals, partners and other organizations with e-mail than it did communicating with other means such as a letter which took time to write and post. The ease to find general information on any topic (which was usually up-to-date) allowed a respondent to use the information in their work

immediately. Prior to the Internet, requesting information through other media often involved a considerable waiting period and the possible risk of the information being out-of-date when it arrived.

> *I've come to rely very heavily on e-mail and the Internet [WWW]. They increase my productivity, they increase the Centre's reach, and they facilitate dialogue with our partners. The first thing I do each morning is check my e-mail. I probably receive 6 to 10 a day and send an equal number.*
>
> Comment from one respondent

The Internet has lessened the importance of the location of those communicating. Some respondents worked at home or on the road and were still in constant communication with the office. Meetings no longer had to be face-to-face with the option of a virtual meeting.

> *It [WWW and e-mail] is very useful, it avoids the displacement in the delivery of information. You can negotiate and discuss aspects of some project or plan without the necessity of meetings. I work in an office from my house and I can take care of my baby and at the same time take care of matters of the Foundation I work for. For me it has been a wonder.*
>
> Comment from one respondent

The Most Valuable E-mail

This section explored two main themes. They were:

1. E-mail Description;
2. E-mail Purpose.

There were 22 responses open coded which included responses from the open-ended questions in the survey, the on-line discussion and the interviews.

1. E-mail Description

Over three-quarters of respondents reported that the most valuable e-mail received was related to work. This included receiving information to build on an existing resource base, information for potential employment, information to be collected and published and results from evaluations done on projects. One respondent also stated that she used e-mail on a more professional than personal basis.

> *It was little more than a year ago we were contacted, through e-mail, by an American researcher who had read our book on traditional Mayan medicine "Confrontation with the Chinese Conceptual System." It was written by a companion of mine and other researchers with a group of Mayan healers during the time when we were working with Mayan population in the state of Logwood. This person, whom we still do not know personally, had reached similar conclusions in her work with indigenous population of Guatemala and Chiapas. When the book fell into her hands she was very excited and proposed to us to translate it to English through electronic channels and obtain a publisher in the USA. We agreed and established a working relationship in which we translated part by part and sent along our concerns and explanations. Also via electronic mail we made contact with the publisher and made the corresponding agreement. Thanks to this one instrument we managed to publish the book in English months ago under the title: " Wind in the Blood. Mayan Healing and Chinese Medicine".*
>
> Comment from one respondent

The remaining respondents reported that the most valuable e-mail received was personal, including using e-mail to contact family and friends, to be a part of an on-line support network and to receive information for personal interest. E-mail had provided an alternative channel to stay linked to family and friends, especially those who were distant and at a relatively lower cost.

> *My son is off travelling and I appreciate being able to make sporadic contact with him in a hotmail account. [I have also] had a couple of lovely supportive and encouraging messages from friends recently who know what my challenges are in life.*
>
> Comment from one respondent

2. E-mail Purpose

Over three-quarters of responses said the most valuable e-mail received was to receive and gather information. This included receiving information to build on an existing resource base, information for personal interest and information for reports and presentations. E-mail was a valuable tool to receive information for the work place and for personal interest..

> *One time I write to BH for a video. They are a Latin American company that sells equipment for radio broadcasting. I had an emergency to get information and in the same day they sent me the information I needed. They saved me as it was an emergency for work. We are installing a [radio] transmitter and I needed information on radio equipment for a report. I needed details about this and the same day I received it. E-mail is a good way for communication.*
>
> Comment from one respondent

The remaining respondents felt that the most valuable e-mail received was from those with whom they wished to keep in touch. One respondent was "agreeably surprised" to receive an e-mail from an old acquaintance with whom the respondent met 20 years earlier when the respondent was residing abroad.

Potential Role of the Internet for the Developing Countries Farm Radio Network

There were three main themes identified in this section out of 36 responses from the on-line discussion:

1. E-mail Benefits;
2. A Forum to Exchange Experiences;
3. Provider of Internet Know-How.

1. E-mail Benefits

When asked what potential role the Internet could play for DCFRN, several respondents discussed the role of e-mail and very few mentioned the role of the WWW.

It seemed that respondents used e-mail more than the WWW for communicating and this may have given them more benefits. As one respondent reported, "while e-mail is now a habit, the Internet [WWW] is not."

In addition respondents reported that if members share experiences and provide answers to one another it might give a sense of ownership and responsibility to and for DCFRN and to themselves. As one respondent stated, "the fact of being able to participate, not passively receive [DCFRN material], gives us a sense of ownership and responsibility."

One-third reported that one benefit of using e-mail was that it encouraged a higher degree of participation than did traditional media such as the fax or telephone. It took less time to type and send a message on e-mail and the cost was relatively lower compared to sending a fax.

> *I think once again e-mail is a suitable tool for the current exercise [on-line discussion for this study]. In other words, if one asked me to answer by fax or postal mail, I would surely not have taken part in DCFRN.*
>
> *"...In the near future, it will be possible to count on a "listserv" program – all the [DCFRN] members could communicate easily, share information, ask questions, etc..."*
>
> *E-mail is a powerful communication tool with least effort, time and money.*
>
> Comments from three respondents

The ability to communicate with anyone in the world regardless of geographical location was an incentive to participate. Some respondents reported that they participated in on-line discussions when the topic was of interest and relevant to their work and to themselves. One respondent felt that on-line discussions were unique because of the

possibility to exchange information in areas of interest world-wide. Another stated that the success of on-line participation depended on the engagement of members and that depended on whether or not the questions were relevant.

Only a few respondents indicated that they could use their e-mail when it suited them (especially with those who had a busy workday or were in the field for a period of time) and were able to maintain contact.

> *I like electronic mail. Sometimes I leave the field for two or three weeks and when I return I can read all the mail and respond to those which seem important to me. Electronic mail allows me to say "I will return contact to you in two weeks". This time does not cost me and the contact is not lost...*
>
> Comment from one respondent

2. A Forum to Exchange Experiences

Just over one-quarter reported that explicit expectations should be outlined for member participation. This included the need to prepare – "knowing beforehand the expectations and the importance the participants will have to give in an event of this type" and that some respondents did not have daily access to the Internet and therefore needed to calculate the commitments they assume.

Some respondents believed they would interact with other members and DCFRN, if the purpose and/or discussions were relevant. One respondent felt that it would be necessary that the Internet be interactive so members felt they were useful. The respondent went on to say that if feedback was delayed for too long, there would be less participation and therefore less interest. Another respondent commented that the operation of the system depended on the engagement of members; "if the questions are relevant, people will answer."

Twenty-eight percent of respondents stated that sharing experiences and learning from others' experience would be a strong incentive to participate on-line. Some respondents stated that potential partnerships could be established with other members working in the same area of interest. Several were curious to know who other members were and what they were doing.

> *The possibility of opening discussion groups on certain subjects. For example, my documents on AIDS are not used by me but to others members they would be very useful. I believe that if we are in the same system we could open forums of discussion on different topics like agriculture, animal raising, human health, economy, etc...*
>
> *It [WWW and e-mail] allows exchange between members of the Network [DCFRN] which would be difficult to obtain individually.*
>
> Comments from two respondents

One-quarter of the responses reported that member profiles would help to make contacts with other members. These respondents felt it was necessary to create a directory of member profiles (those of who consented to share their information) in order for members to learn, contact, share and co-operate with other members. As one respondent stated, "it would be desirable if all members could present a brief about themselves, what they would like and what they would like to contribute."

3. Provider of Internet Know-How

> *...It [to provide information on how to use the WWW and e-mail] will be really beneficial to participants. Any channel of getting information to participants should be explored and utilised. I think a combination of the three [print, e-mail and the WWW] will do very well so that those who cannot make use on one can benefit from the other methods of dissemination.*
>
> Comment from one respondent

Thirty-one percent of respondents stated that different applications of the Internet should be tested with members. For example, a live on-line chat or an evaluation panel for scripts, on the website should be given a trial run with member feedback before it was adopted as an application. One respondent felt it was wise of DCFRN to use suggested formats on a trial basis and allow for responses to identify which format (s) is (are) the most useful for such a purpose. Several of these respondents recommended that the adoption of new communication channels must be done in a simple manner – "I believe it must be practical and in clear and simple form, without making it complicated for the people."

Almost a one-quarter of the responses indicated that that information about the Internet should be provided on the website and in print material such as *Voices*. These respondents believed that basic information about the use of Internet on the DCFRN website and in print material would be beneficial.

> *There are many sources on the Internet on how to use the Internet [WWW] and e-mail. But people who need help on how to use e-mail/WWW will not know how this information is available and even if they do, they will now know where to find it. DCFRN should provide simplified information on its [web] site for use by those that need help.*
>
> *I think both forms [printed material and on-line] are recommendable. A page on the Web that explains some steps is good. But what do we do when we do not even know how to enter that page? Therefore it is recommendable to design a section in Voices [the newsletter] that includes, little by little, some basic elements on the use of Internet and e-mail.*
>
> *I believe all media should be used to sensitise people. Some may require this information before they can get on the Web. The print [scripts] and Voices [the newsletter] reach so many people in developing countries that have no access to the Internet and my be sensitised to the advantages of e-mail and Internet [WWW].*
>
> Comments from three respondents

Interview Findings

Seven personal interviews were conducted in Honduras in and surrounding the capital city of Tegucigalpa. In addition to the data emerging from the personal interviews that contributed to the findings already reported in this chapter, there were four threads of data that specifically came from these respondents – the nature of the information DCFRN provided its members, the use of local and national information resources, the importance of radio in rural development and the role of Internet.

The interviewees felt that DCFRN provided practical, educational, simple and concrete information to its respondents. In some cases, it had to be adapted to a local context but the content was rarely revised. There was no need to simplify the information (reference was made by one interviewee to the technical nature of other information resources and the necessity to revise in order for it to be useful). However, there was sentiment that the information was too brief. One respondent described it as "too short, similar to an introduction to a topic and then it suddenly finishes." According to one-third of the interviewees, the information acted as an introduction to a topic and they had to conduct further research for a complete report to be used either in radio or other programs. Other concerns about the information were that, at times, it was too country-specific, theme-specific or the terminology was foreign and could not be used by the interviewees.

The primary resources of information were local, national or Latin American. The use of international resources acted as a complement to these resources. This use of local resources supported the notion that if a network was created, there was the possibility

respondents could benefit from the collective use of local, national and Latin American resources. Examples of the resources used by respondents were:

- National magazines *Asociacion Agricultura Sostenible en Honduras* (*The Association for Sustainable Agriculture in Honduras*) and *Salud Reproductive* (*Reproductive Health*, a focus on health of mothers);
- Central American magazines *Laderas*, *Corra La Voz* and *Comunica* (no translation);
- Department of Agriculture and Communication received information from *farmer reporters* (explained below);
- National newspaper *El Nacional* (*The National*);
- Nicaraguan booklet by Daniel Cagnon, *Machete Verde*(*Green Machete*);
- Information from national organizations Vecinos Mundiales (World-wide Neighbourhood) and FHIA (Hondurian Foundation for Agriculture Research);
- Information from a national university, Escuela Agricola Panamericana Zamorano;
- National organizations Consede and Cidico which are Christian rural development NGOs who work in Choluteca, Siguantepeque and Comayagua (towns in Honduras);
- An international organization called Partners of the Americas (Honduran chapter);
- International magazines *Paso o Paso* (*Step by Step*) by Tearfund and *Campesino a Campesino* (*Farmer to Farmer)* who focus on Latin America.

One interviewee specifically asked what other members were doing in his field of work. He was interested to know how he could contact them and wanted to know how he could make a network with other people and groups in the same area of interest. Therefore, there was a climate of support to network locally, nationally and internationally within the DCFRN organization by the interviewees.

Additionally, two interviewees made it a priority to gather information at the ground level. For example, one interviewee visited farmers to gather information and took any questions or problems they had to address them in future radio programs. It was important to have local, relevant information for rural farmers and communities. Another had a network of "farmer reporters" throughout rural Honduras. The role of the farmer reporters was to talk with the farmers and others in their own community to gather information they wished to share as well as take any questions or problems they were

experiencing. The farmer reporters gave the information to the interviewee's department, the Department of Agriculture and Communication, and the issues were addressed in future radio programs. One important side note was that the farmer reporters volunteered their time to do this.

There was an opportunity for me to visit a group of farmers in the town of Guinope. There, farmers gathered to listen to the radio programs created by one interviewee who was a radio programmer and broadcaster. After listening to the broadcasts they discussed the relevance of the content to their own lives. Here is an excerpt from my research journal, dated May 13, 2000:

> *While the farmers listen to the tapes [radio broadcast programs created by respondent 4003] they discuss amongst themselves what they are hearing. They relate to the stories on the programs and discuss their own personal experiences. They seem very interested in the content of the programs. It is of great interest because what is being said on the programs is of importance to what they experience themselves.*

This was 'on the ground' contact. For two interviewees, there was a priority to communicate with rural communities, especially through radio, by placing an emphasis on receiving input and giving feedback to the communities. These interviewees developed and delivered radio programs in nutrition, anemia, boiling water, Vitamin A, the health of pregnant mothers, Hurricane Mitch, conservation of seeds and forest management. For example, one interviewee developed the following radio programs:

- *Hurricane Mitch* – Natural disasters and the management of water catchments;
- *Seeds: a source of life* – Conservation of seeds and sustainable agriculture;
- *Tio Canela 75* – Quality of nourishment and better utilization of seeds;
- *Help the Forest* - Prevention and control of forest fires

The World Bank (1999/2000) stated that the adult illiteracy rate of the Honduran population was 26.6 percent in 1998. However, one interviewee believed it was between 30-50 percent and as high as 80 percent in some areas. Another interviewee specifically reported that the rate was 42 percent and of the 58 percent who were literate only five to eight percent knew about the Internet. This rate of illiteracy contributed to the popularity of radio as the number one information dissemination tool in rural communities. These communities continue to rely heavily on the radio and, as one interviewee remarked about the nature of Honduran farmers, "the farmers use a machete and a radio." Almost three-quarters of interviewees reported using or having used radio in their work as the main tool for information dissemination.

The Internet seemed to be used only as alternative information resources. This low level of use seemed to be due to three general factors. First, the interviewees were unaware of available local, national and Latin American resources on the Internet (or did not know how to access them). Second, the possibility existed that the resources were not available on the Internet. Third, for some, the lack of skills and knowledge about how to use the technology prevented further use. However, there was a strong sense that Internet use was growing. All but two interviewees had access to the Internet and the two who did not were confident that they would within the next year. Those who did have it were beginning to use or have been using the Internet as information resources. All interviewees were aware of the vast amount of information on the World Wide Web and believed it would benefit them. One recurring statement about the Internet was that it provided timely, up-to-date information that would be and was valuable to their work. As one interviewee commented, the "Internet changed the world. It made it small."

Overall, the personal interviews provided insight on information retrieval and dissemination. There was general acceptance and excitement about the Internet, not only for DCFRN but also for their own work. At the time of the personal interviews, the medium was providing minimal support in their work but use was gradually increasing.

Informal Interview with Staff of DCFRN

I also conducted informal interviews with Nancy Bennett, the Executive Director of DCFRN and Mary Hanson, the librarian of DCFRN. Here is a summary of their views.

The organization was in the process of creating and implementing an overall strategic plan in which new strategies such as new technologies would be considered as part of the organization's mission statement. For example, this objective was found in the draft strategic plan:

> *To support the use of rural radio, together with new technologies, in effective, participatory communication strategies that benefit small-scale farmers. We are guided in all aspects of our work by our partners in development*

Within this strategic plan, new technology was identified as a priority. Within this new technology strategy, focus was placed on:

- strengthening rural broadcasters;
- to be rural focused;
- to develop partner communication skills;
- to focus on radio capacity building of broadcasters;
- to use radio together with new technologies;
- to have capacity to use most appropriate communication technologies;
- to always poised to use appropriate communication technologies;
- to experiment with new communication technologies.

The staff (Executive Director and librarian) both believed that the use of the Internet would build and strengthen the relationship with their members. Some areas

expected to significantly improve were the response time and provision of information to member requests and the availability of past and current scripts on a 24 hour basis from an on-line library and database search engine. As the Executive Director observed, "this immediate access to information is invaluable in situations such as Hurricane Mitch which swept through Central America in 1998. Farm Radio [DCFRN members] members will be able to access critical information about disaster mitigation and disaster relief, and get it out to rural communities via radio."

This step was seen by the organization as contributing to the role of DCFRN as a facilitator and it will move away from the traditional role of an information provider. It was hoped that providing links and information about members on the website would develop and strengthen local to international partnerships and collaborative activities. One of Bennett's ideas in order to help nurture these partnerships was to offer forums to promote the sharing of knowledge about agricultural communication and rural development communication on a global basis. What was essential, according to Bennett, was that members were seen as "the ideal partners in ICT development projects because they will be the links between the newer technologies, and the traditional medium of radio which reaches out to millions of rural residents who may never use, or even see, a computer."

However, in order to integrate new technologies into the strategic plan there were a few areas that needed to be addressed:

- Members need training in WWW research and in the use of e-mail;
- They must be able to adapt information from their research to their audience (where it is impossible to assume what the education level is);
- Must have effective skills in assessing the communication needs of their listeners — what they need to hear, certainly, but also what they need to say;
- How to use radio to their advantage;

- There must be a cultural and political climate that supports the use of radio for community-based development programming.

Currently, DCFRN is compiling information about potential website hosts for the possibility to build a website that include elements identified previously in this chapter under Possible Website Components.

Summary

The first section described the member base of the Developing Countries Farm Radio Network, reporting characteristics such as active and inactive members, division by language, and e-mail address listings. Frequencies were given to describe characteristics such as member classification, continent of residence, primary language and gender. The hardware, software and connections to access the Internet was described, as well as the respondents' use of the medium. The current state of communication between the Developing Countries Farm Radio Network and members of the organization was described. Incentives and barriers to participate on-line with DCFRN and other members were identified and whether or not a member directory would be beneficial.

Possible new components and / or services for the DCFRN website were reported. A section reported a list of WWW websites respondents used the most and why. Cross-tabulation tests categorized the four independent variables (member classification, continent of residence, primary language and gender) and one category that included only dependent variables.

There was one valid chi-square test which reported whether or not two or more variables were independent. The test indicated that females and males marginally differed in maintaining a library of past scripts.

There were three major questions answered through the open-coding technique of grounded theory. These three questions asked i) What was the general perception of the Internet? ii) What is the most valuable e-mail you ever received? and iii) What potential role does the Internet play for the Developing Countries Farm Radio Network?

An analysis of the personal interviews was included and the final section presented information provided by two staff of DCFRN. This section identified ideas and views of staff about the use of Internet in the organization.

Chapter 5

SUMMARY, DISCUSSION AND CONCLUSIONS

In this chapter, a summary of the study is presented, along with the discussion and conclusions. There are two major areas of discussion from the findings which involve the Internet and the potential DCFRN on-line network. Conclusions are drawn from the findings and recommendations are offered for Internet implementation and for conducting subsequent studies on the use of Internet as a communication and information delivery channel in other organizations.

Summary of the Study

The goal of the study was to examine the use of the Internet in complementing the primary communication system of the Developing Countries Farm Radio Network and to provide useful information if the organization decides to embark on any activity that will involve the media. The specific objectives were:

1. To investigate the attitudes of DCFRN members about the use of on-line communication;
2. To explore how members use the Internet;
3. To investigate how valuable scripts are to members and the importance of timely dissemination of information;
4. To determine the hardware and software specifications of equipment currently in use;
5. To identify the barriers in the use of the Internet with DCFRN;
6. To identify incentives in promoting the use of the Internet with DCFRN.

Quantitative and qualitative data were obtained through an on-line survey, on-line discussion group, personal interviews and an informal interview with two staff members of DCFRN. The data were presented with quantitative data first and qualitative data second. The statistical software package, SPSS, was used to analyze the quantitative

data. Grounded Theory, more specifically, open coding was used to identify themes and explain them by their attributes.

The survey successfully targeted members who had access to e-mail, as they were the only respondents to the survey. Non-random sampling, self-selection and a small sample size were recognized as limitations of the methods used in the study which restrict the generalizability of the findings.

The majority of the respondents were from Latin America and the Caribbean (48 percent), Spanish (50 percent), radio broadcasters (34 percent), and male (74 percent). Almost half of the respondents communicated with DCFRN approximately three to six times a year and almost the same number of respondents sent an evaluation of an information package by Infopoll. Just over half of the respondents reported that they had not contributed information or ideas to DCFRN for future packages. The majority of respondents had never contacted another member or have been contacted by another member and had never made indirect contact with another member through DCFRN.

On the use of Internet, the majority of respondents used e-mail and traditional media such as phone and fax for regular communication. Almost all respondents had continuous access to the Internet. The major obstacle for lack of connection to the Internet was Internet Service Provider failures. Most respondents are using Pentiums, use Microsoft 95 and better and connect to Internet using a modem with the majority using 33k or less. Nearly all persons in the respondents' organizations used the Internet and was mostly for communication/information exchange (personal and work related) and for knowledge accumulation (research and getting the latest news).

The main incentives to participate in an on-line network were the opportunity to exchange information and communicate with other members. However, lack of time was identified as the major obstacle to this participation. The most popular website elements chosen by respondents were a reference library of past scripts, the latest script package posted and the latest *Voices* posted. The next most popular website elements were an information panel (to provide information to DCFRN), an evaluation panel and a facilitated discussion. A large number of respondents reported a member directory would be beneficial and believed it should be made available on the DCFRN website. The majority gave permission to be published in the directory. The websites used most were the FAO, ECHO, IDRC and Oneworld. The two principal search engines identified were Yahoo and Altavista. The English-speaking respondents had visited the DCFRN website most frequently.

The largest number of respondents perceived the Internet mainly as an information provider but also a forum to create and maintain information networks (network promoter). The most frequently stated concern about Internet access was cost. The most positive aspect of the Internet was that it saved time. When asked what benefits the Internet had to offer, the largest number of respondents stated that e-mail encouraged participation. Respondents suggested that explicit expectations to participate in a DCFRN on-line network should be outlined, sharing experiences was an incentive to participate and member profiles would help in making contacts with other members. Some respondents felt that DCFRN should test different applications of the Internet with members as well as provide information about the medium on the website and in print material.

Personal interviews in Honduras revealed that the information DCFRN provided in their script packages was thought to be valuable because the content was simple and practical. The illiteracy rate of Honduras made radio the principal medium for communication and information dissemination and while respondents were using the Internet, their use was secondary. There was a general feeling of acceptance and willingness to increase the use of the Internet for communication and information exchange.

DCFRN staff believed that the Internet would help build and strengthen relationships with members and other partners. It was also believed that it would aid in the process of decentralizing the organizational structure and help move from the role of an information provider to one of an information facilitator. However, in order to take advantage of the medium there must be a climate of acceptance among members and partnerships as well as the presence of knowledge and skills.

Discussion

1. The Internet

In general, the Internet failed to fully live up to its potential due mainly to the shortage of money for the accumulation, implementation and maintenance of the resources. Some respondents believed that the technology has helped widen the gap (the digital divide) between the developed and developing, between the urban and rural and upholds class systems in many countries.

There is no single accepted definition of the 'digital divide.' In general it can be described as the divide between those with access to new technologies and those without access to new technologies (Irving, 1999). The term was first coined in the mid-1990s to

describe the issue of whether regulation should be built into the Telecommunication Act of 1996 to offset market forces arising with new information infrastructure (Digital Partners, 2000).

A certain percentage of people in each country enjoy the privilege to telecommunication and benefit from services, such as communication, information content, training and employment. Those who do not have access have less opportunity to participate in the information-based economy as well as less chance to participate in education, training and communication. Furthermore, those who are poor and live in rural areas are about 20 times more in danger of "being left behind" than residents of suburban areas and developed countries (Irving, 2000).

With any given medium, the great barrier that remains is universal access. Nonetheless, several respondents were aware of the potential of the Internet as a tool for rural development but remained skeptical. Until funding restrictions are relieved the gap between the 'haves' and the 'have-nots.'

C.G (1998), McNeil (1998) and Ibrahim (2000) referred to another element which feeds the digital divide, the domination of the English language on the World Wide Web. The bulk of information is in this language. Not only does this language domination exclude those who do not understand the English language but also it excludes those who cannot read or write. As reported in Chapter Four, one Spanish respondent expressed her frustration with the Internet as an information resource because of the English language. Therefore, the medium did not fully serve her needs. However, there is a trend to offer website hosting and services in alternate languages. For example, the Food and Agriculture website (http://www.fao.org) offers its service in English, French, Spanish,

Arabic and Japanese. The free web-based e-mail service, Hotmail (http://www.hotmail.com) offers its service in English, French, Spanish, Portuguese, Italian, German and Japanese.

There is also the danger of the unreliability of information. Some information from the Internet could misrepresent or misperceive problems of rural development. Only three percent of respondents were aware of the danger of information credibility. What is important to note was the percentage of respondents who did not refer to information credibility as a concern. One respondent stated he believed most of what he read on the Internet and did not question the validity of the information.

A number of respondents felt that DCFRN should provide information on how to use the Internet. The information should be provided on-line and in print format. Respondents suggested that before an on-line system was adopted by DCFRN, different applications should be given a trial run with members and any decision made about the adoption of applications should include member feedback. In order to benefit from the World Wide Web, users needed to know how to use it. Most respondents stated the WWW was a great information resource when one knows how to 'surf' properly. This suggested that an element of training was needed and as George (1991) commented, technology is only as useful as the skill and creativity of the person using the technology.

A majority of the respondents felt that the Internet allowed for quick and efficient communication and almost immediate access to information. This was felt to be an advantage over traditional means of seeking information in both their professional and personal lives. One of the main incentives for using the Internet was access to timely, up-to-date information. Spore (1998) reported that many farmers suffer economically due to

outdated, localized information. It seemed to be a crucial element if one wanted to enhance one's own productivity whether for economic benefit (such as a farmer might) or for reaching out to one's own audience (such as broadcasters and extensionists). As the USAID (Chronical, 1998), stated, improved communication and information access are directly related to improved agricultural production, food security and rural development.

Respondents were asked to give their general perceptions about the Internet; most responses commented on the different functions of the medium. The WWW was viewed as an information source and e-mail as a communication tool. The functions of both media were similar in that they were used to seek or give information. The difference between them is that e-mail required one to proactively seek or give information (by making direct contact with someone) whereas the WWW only required passive seeking and providing information (by simply surfing the WWW or publishing information on a website).

When asked what potential role the Internet could play for DCFRN, the majority of respondents discussed the role of e-mail and very few mentioned the role of the WWW. It seemed that respondents used e-mail more than the WWW and that more benefits were felt to be associated with this medium. As one respondent stated, "while e-mail is now a habit, the Internet [WWW] is not". This comment suggested that while time should be spent on the development of the DCFRN website, focus should given on creating and implementing listserve applications for members. The direct contact, speed and lower cost were factors that supported this acceptance. Moreover, several respondents believed they would participate if the topics were of interest and somehow benefited their work.

The majority of the on-line discussion respondents also indicated that their most valuable e-mail was work-related and involved gathering information for some specific purpose. The gathering of information included receiving information to build on an existing resource base, information for potential employment, information to be collected and published and results from evaluations done on projects. One respondent commented that she used e-mail more on a professional than on a personal basis. This, too, suggested that e-mail could be used as a tool for communication and information exchange with DCFRN because respondents have already benefited from e-mail in work. E-mail was readily accepted as a communication tool and respondents seemed willing to continue to use it.

Therefore, e-mail was useful in two overall ways; it encouraged use because of its speed, lower cost and opportunity to communicate worldwide and respondents used it when they found the time. The cost of communicating via e-mail was relatively cheap compared to the fax or telephone. These two benefits were cited in the literature (C.G, 1998; Jensen, 1998; and Boldt, 1997) as well as from respondents and therefore could be an incentive to use e-mail as a communication tool with DCFRN.

The WWW had not been embraced by respondents like e-mail because of the difficulty in finding relevant information and at times, the slowness of the Internet server. There was, however, potential for increased WWW-use by respondents because they were aware of the huge pool of untapped resources. Nonetheless, the problem can be found in the lack of training and knowledge and respondents felt this was a major barrier. As noted by Anderson *et al.* (1998), information and communication technologies are new to many people in rural areas and that therefore need assistance to become familiar

with the uses of the technology, potential applications and appropriate content use for their situation. Richardson (1998) believes that one reason for minimal Internet knowledge in rural areas is lack of training for the telecommunications service operators. The operators were usually provided with "rather dry technical training, but get little or no training on ways of facilitating and enhancing stakeholder participation" (Richardson, 1998: 26). Respondents did not enjoy wasting valuable time and sifting through a myriad of irrelevant information. They were aware of the potential benefits of the Internet but were dissuaded from using these tools (more so the WWW) because of the noted difficulties. They believed it would be beneficial if DCFRN provided simple information on how to use the Internet.

It is clear that the organization is moving in the direction to incorporate new technologies and media to better serve their members. DCFRN has identified the importance of creating an information network among the members where ideas and ownership of published material (scripts) would be favourable. IM Europe (1999) referred to the opportunity individuals were given to publish information and provide contact information. Such a possibility has never existed for the average person. This chance for members to publish with DCFRN and its members would be an enriching experience. Prior to the Internet, it might not have been possible to obtain resources that were available via other media because the cost to publish and deliver might have been too expensive. For example, one Peruvian respondent began to send his bi-monthly newsletter titled, *Canto Vivo*, on topics such as health, nutrition, agriculture, development and politics to DCFRN. Prior to this study, the awareness to use e-mail as a delivery

channel by this respondent had not developed. Presently, *Canto Vivo* is being used by DCFRN as a future on-line resource.

The results of the research indicated that the DCFRN website should provide most of its published information, such as the scripts and *Voices*, a section for facilitated discussion among members, a section for members to provide information to DCFRN and members and a section for members to evaluate the scripts. These results suggested that the website and possible listserve should be highly interactive.

The SANGONeT model of an electronic network should be considered by DCFRN when exploring potential components for an on-line network. SANGONeT provides a portal of information so their users do not spend an excessive amount of time 'surfing' the WWW. A portal is a central website where users can search for diverse information within a given field, such as information about civil society. It offers new venues for users to search for information directly and indirectly related to their field of interest. SANGONet not only offers a portal but training and support, Internet demonstrations and discussion forums. Respondents recommended that these components would be useful for the DCFRN website.

Richardson and Paisley (1998) had observed that people are adept in adapting technologies for their own use, as in the case with the Nunavut Planning Commission. The potential on-line network of DCFRN will take time to evolve. However, with continuous testing and evaluation of possible components between DCFRN and its members, it should be viable. Some members might begin to use the Internet as the sole communication channel with DCFRN; others might find a balance between the old medium (such as mailed information packages) and the new medium (such as joining an

on-line discussion group with members who have the same interests); and there might be some members who are content receiving script packages by mail when they do not wish to participate in a network with other members.

It was also noted by C.G. (1998) and Boldt (1997) that there was a growing number of NGOs making use of new technologies. Although only 20 percent of DCFRN members have an active e-mail address, there is hope in the future more and more members will have access to the Internet. They, too, will be able to contribute to and benefit from a DCFRN on-line network. Additionally, the percentage of members who actually have access to the Internet could be higher, as eight percent had given an incorrect e-mail address and some members may simply have not given their information to the organization.

2. Potential DCFRN On-line Network

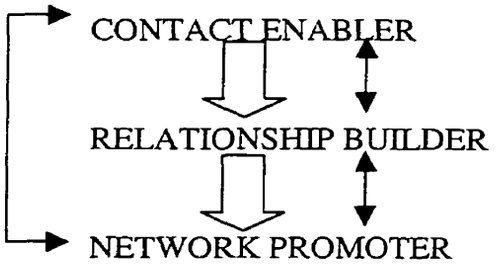
Networks and networking are long established human systems. With the introduction of the Internet, new forms have been created – electronic networks and electronic networking. This new electronic arena is growing at a phenomenal rate. One reason for its widespread adoption is the ease and comfort to make contacts. For many people, there is initial discomfort when meeting someone face-to-face or over the phone. With the Internet, an individual simply types a message into a computer without any threat to their idea or identity. At the same time it is a disadvantage because nothing is more valuable than human contact. However, had it not been for the Internet, countless networks or networking would never exist, especially where geography is a factor.

Arora-Jonsson (1999/2000) had defined a network as an infrastructure in which patterns and lines of communication were drawn up in advance. A DCFRN on-line

network could be established but its success depends on whether or not members participate and receive benefits by doing so. There is potential for informal networks to spin off from the main on-line network if members contact each other directly and establish relationships. DCFRN's role is solely to provide the resources (for example, the member directory), information (for example, a searchable database for past scripts) and a forum for members to virtually meet, share knowledge and experiences and collaborate.

The attributes identified in Chapter Four were contact enabler, relationship builder and network promoter. Each attribute was based on the primary element of communication and how it facilitated communication. The three attributes build on each other since making a contact could lead to a relationship that might lead to a network of interconnected relationships. In order to make the first contact, communication was required by the information-seeking individual. Once the initial hurdle of making the first contact was completed, the possible relationship established (whether short-term or long-term) facilitated communication because a level of comfort and knowledge about the contacted individual was known. Moreover, working within one attribute means, for example, in the network promoter, that relationships were being established and nurtured and contacts were being made continuously. Figure 5.1 depicts the relationship among these three attributes.

Figure 5.1 Communication Facilitator



Respondents who made reference to one of the attributes generally made reference to another attribute. For example, one respondent said that a strong relationship between her organization and their funders was established because of the relative ease of making contact and establishing a relationship via e-mail. The Figure portrays a slightly cyclical movement but with the potential to increase in size due to the addition of new contacts, new relationships and new networks.

The results suggested that very little communication existed within the DCFRN network. Those who have communicated with DCFRN have done so only when prompted by Infopoll. Communication between members was rare. Three-quarters of the of the respondents never made contact with other members, 79 percent have never been contacted by another member and an overwhelming 80 percent of members had never made contact indirectly via DCFRN. This finding indicated that members have not initiated communication with other members and that there was little or no existence of a network in the Developing Countries Farm Radio Network. This situation could be related to two factors. First, DCFRN might not have made it known that communication between members was possible. This lack of member communication could be based on the structure of the organization in which communication has mostly been one-way, with DCFRN providing information to members. Second, there could be little desire among members to communicate with each other. However, this alternative was unlikely as many respondents indicated they would like to know who the other members are and what they do. The incentives identified for participation in an on-line network were to exchange information and communicate with other members.

As Richardson (1998) had argued, the Internet has the power to move across any social and geographical distance and help people find ways of facilitating the flow of information and knowledge. The potential on-line network of DCFRN would prove a good example of this Internet use. The member base is already diverse both culturally and geographically. To provide a forum in which they could exchange and collaborate on mutually beneficial topics might reduce social and geographical distances.

The majority of respondents identified, above all else, the desire to exchange experiences with other members. The role of DCFRN would be one of an information facilitator, providing a forum in which to share, learn and collaborate. Respondents reported that there was a need to clearly outline expectations of participation. They also commented on the usefulness of a member directory with member profiles in order to facilitate the contact process and that the directory should be made available on-line so that they would have the option to directly contact members and to find out who does what. This suggestion reflects Smolan's (1996) belief that the appeal of telecommunications as tools for development is not about technology and information but the people and their ability to share with one another. Respondents used the Internet mostly for communication and information exchange. This use of the medium was a good indication that an information network could prove beneficial for the DCFRN organization.

The major barrier to participation in an on-line network was lack of time. This barrier might hamper regular participation from members but not prevent it altogether. As long as members are aware that information is available to them on-line and that they

have an opportunity to connect with other members, the on-line network is a sufficient and realistic goal for DCFRN.

A possibility always exists that the Internet may be inappropriate and therefore irrelevant to people's needs. Additionally, the majority of the world's population and members of DCFRN do not have access to the Internet. However, these inequalities do not mean that the medium should not be used. As Hawkins and Valentin argue (1997:46)

> The future of ICTs is uncertain, but these uncertainties do not justify a "do-nothing" policy. Each country has a clear priority: to create an information society and an information economy that reflects its culture and needs, while being able to choose its optimal role in the global community.

Respondents, staff of DCFRN and other interested parties identified the concern of those who had access and those who did not. The potential benefits of the medium would only be offered to those who had access and this could possibly contribute to the information divide between the 'haves' and the 'have-nots.' Regardless, this knowledge does not justify not taking advantage of the benefits it offers to those who have access.

Furthermore, as asserted by Richardson (1998) and by respondents, more and more people were getting connected each day. There was ample reason to pursue the use of the Internet. Here is an excerpt from my research journal dated May 25, 2000, after conducting the personal interviews about the potential use of the Internet:

> *My research is very important for the NGO sector. It is an example of how an organization can use the Internet for its benefit. It is tailoring the Internet* ***to its needs*** *instead of trying to mold to it. The Internet is an overwhelming entity. It is too big to really understand and know what consequences it might unleash. Obviously the consequences vary in degree for different users. How the Internet affects a big business for profit or a small NGO depends on how and what it is being used for. In DCFRN's case, the Internet must be thought of as an alternative channel of communication instead of* ***the*** *channel. The main focus of DCFRN is radio. It always has been and will continue to do so. Because of this,*

focus and resources should be placed in the area of radio. However, as a secondary goal, the Internet needs to be explored.

Several respondents were in favour of implementing the Internet as complementary tools for communication and information dissemination. There will always be a percentage of members who do not wish to use this medium because they might not find any benefit in doing so. This choice must be respected. It is important to remember that the study explored the potential role of the Internet as a communication and information delivery channel complementary to existing channels of communication. The medium would not replace or change the existing structure, mission and current communication channels. The Internet would be offered as an additional service as well as provide a forum for an on-line network for members and DCFRN. This service would act in accordance with DCFRN's wish to decentralize and move away from the role of information provider to one of information facilitator.

The study included respondents from the three main member groups of DCFRN. The groups were divided by their primary languages, English, Spanish and French. There was a higher level of participation in the survey and in the on-line discussion from the Spanish group compared to the English and French groups. However, slightly over one-third of the Spanish group had an active e-mail address. One would have expected a higher level of participation from English-speaking members as they had the majority of active e-mail addresses. This degree of participation suggested a higher level of participation from Spanish-speaking members as in relation to the language groups of active e-mail address listings.

Conclusions

It is difficult to dampen the enthusiasm of those who believe in the capabilities of technology when they are enamoured with a new invention. The relative ease to be blind-sighted to the consequences is common. One must remember that technology is only as useful as the skill and creativity of its human operator (George, 1991). Richardson (1998:12) reports that communication services that benefit rural communities depend less on efficient technology than on effective implementation strategies. The overwhelming support for the use of the Internet as a complementary communication and information delivery channel revealed in this study indicate that the Internet has something useful to offer DCFRN and its members. The Internet can play a role in both work and personal spheres and can be adopted to create an on-line network for accessing and exchanging information, communication and collaboration.

To increase the chance for a higher level of comfort with the new medium and to elicit participation in an on-line network, e-mail should be the first application introduced and used by DCFRN and its members. Where language options are most needed are in grassroots organizations, NGOs, and for those who make up civil society. More money is necessary to extend this service and many do not have the funds to even obtain a computer with e-mail access. There is a need for e-mail programs and the website to be simultaneously available in English, Spanish and French. Furthermore, there is a strong possibility that the Internet, as a communication channel in DCFRN, will be more successful with members who are Spanish-speaking (in terms of adoption and use).

The DCFRN website will only be useful if it provides relevant information and is interactive. The level of interest expressed by respondents in learning more about the

Internet suggested that information about the medium and its application should be provided on-line and in print material. Addressing the lack of knowledge, training and costs associated with the Internet could increase the use of the medium by members.

To provide information and offer services to DCFRN members, e-mail-based programs and an interactive website are good ways to reach this audience. These programs and website can insure direct contact between members or at least provides an opportunity to enter into dialogue with others as well as provide a forum to possibly increase communication between DCFRN and its members.

The respondents who had access to the Internet used e-mail in their daily communication. It is concluded that if other members have Internet access they are also likely to use it in their daily communication. This means that the medium is an appropriate channel to publish and disseminate information related to development.

With the growth of new communication technology it is difficult to ascertain what role it has in communication for development and whether it will benefit or further hinder developing countries. Even in cases where one medium works well, there is usually more success when using different communication channels in a mutually reinforcing manner. As we enter the 'Information Society', it becomes apparent for the necessity to be connected via the Internet, especially if intellectual capital becomes the driving force of society. The abundance of information is phenomenal and the ability to tap into this resource is based on infrastructure, accessibility and training.

The potential use of the Internet in DCFRN can possibly shift the current information and communication structure to one that is more participative in nature in terms of information sharing and stakeholder involvement. This shift could potentially

contribute to the field of communication for development. An on-line network could provide a comfortable environment where members enter into dialogue to share information and work on problem-solving and possible solutions for their own development initiatives and those of each other. Any progress or lessons learned from this possible DCFRN initiative will contribute to a better understanding of this continuous evolving field. The possible on-line network reflects the overall purpose of the field of communication for development as it to focuses on creating environments through appropriate media where people can come together and enter into dialogue with others who may benefit from the information shared.

Recommendations

1. For Internet Implementation

The following recommendations are offered for consideration when planning to introduce new communication channels:

- Employ the Internet as complementary to existing channels of communication and information delivery. Explore the possibility of using the medium to establish an on-line network;
- Discuss the value of sharing information with one another and the importance of on-line networking;
- Provide incentives, such as a prize draw to participate in the initial on-line network;
- Insure that participation in the on-line network and contribution of information is valued and publicized. For example, each month highlight an individual and her or his work on-line and in print format;
- To encourage interaction, begin with simple tools for communication such as listserves;
- Focus on e-mail applications prior to WWW applications when establishing an on-line network. For example, an e-mail network should be considered before on-line chat rooms or discussion boards;

- Develop the website with user input;
- Provide on-line products and services in the languages of the target audience;
- Actively encourage marginalized groups (for example, women) to use the Internet;
- Provide basic 'how-to' information on the use of the new medium;
- Increase and maintain exposure to the Internet in print format. For example, in each script package designate a section dedicated to reporting the progress on the use of Internet within DCFRN and by its members;
- Provide Internet information of interest such as relevant URL links, simple technical information and existing programs or projects who use the medium.

2. For Future Research

The following recommendations are offered for consideration for conducting future research:

- Collect additional socio-economic, as well as a fuller profile of their communication behaviour;
- Explore the use of traditional media with and without new media such as the Internet;
- Study the World Wide Web and e-mail as two separate tools;
- Research the meaning and benefits of networks and networking;
- Conduct a longitudinal study to detect shifting trends in user opinions and behaviours;
- Conduct comparison studies such as members with Internet access and members without access;
- If resources permit, include a more extensive method of research, such as face-to-face interviews with a larger number of people.

The Developing Countries Farm Radio Network was created over 20 years ago by George Atkins to help rural broadcasters and the farmers they serve. The organization has grown tremendously over the years but mainly relies on the courier and mail system to deliver information packages and for member communication. By examining the

potential use of the Internet as a complementary tool for information delivery and communication, this study will, I hope, assist DCFRN in identifying, planning and implementing new services as well as improving existing services to members. Furthermore, I hope that it will be of use to development communicators and to other development related organizations. The information of the study will be available on the website of DCFRN (http://www.farmradio.org).

REFERENCES

Adler Hellman, Judith. April 8, 2000. "On Chiapas" The Role and Impacts of the Internet in International Development. Panel Discussion at the Ontario Council for International Cooperation.

Agunga, Robert, A. 1997. Developing the Third World A Communication Approach. New York: Nova Scotia Publishers, Inc..

AMARC. 2000. World Association of Community Radio Broadcasters. [On-line: http://www.amarc.org]

Anderson, Jon, et al. 1998. "Applying the lessons of participatory communication and training to rural telecentres" " in Richardson, Don and Lynnita Paisley (*eds.*). The *first* mile of connectivity Advancing telecommunications for rural development through a participatory communication approach. Rome: FAO, 212-222.

Arora-Jonsson, Seema. 1999/2000. "Networking for dialogue and action An example for the Forests, Trees and People Programme" Forest, Trees and People Newsletter. (40/41): 54-58.

Avis, Walter,S. *et al.* 1983. Gage Canadian Dictionary Toronto.Toronto: Gage Educational Publishing Company.

Bennett, Nancy. Personal informal interview. July 13, 2000.

Bennett, Nancy. 1997/1998. "Exchanging practical ideas for food and health." Developing Countries Farm Radio Network Annual Report.

Bessette, Guy. 1996. "Communication for development in West and Central Africa: Toward a Research and Intervention Agenda." in Bessettee, G & C.V. Rajasunderam (*eds.*). Participatory Communication: A West African Agenda. Malaysia: Southbound, Penang.

Bittner, Patricia and Claude de Ville de Goyet. November/December, 1997. "An Internet forum for the management of disasters?" The Magazine of the World Health Organization. (6): 6-7.

Black, John. 1986. "Reducing Isolation: Telecommunications and Rural Development." The Sixth Arkelton Lecture. Guelph :University of Guelph.

Boldt, Klaus. January/February,1997. "The Information Revolution Who Profits from Global Networks?" Development and Cooperation. (1): 8-12.

CFNY Toronto FM Radio Station. Radio Broadcast on Number of Web Pages Published on the WWW. March, 2000.

Chronical. July/August, 1998. "International Institute of Tropical Agriculture pioneers use of the Internet" International Agriculture Development, (18): 4.

C.G. July/August, 1998. "Indigenous Groups on-line" Sources. (103): 8-9.

Cleaver, Harry. 1998. The Zapatistas and the Electronic Fabric of Struggle Chiapas95. [On-line: http://www.eco.utexas.edu/faculty/Cleaver/chiapas95.html]
Also published in John Holloway and Eloína Peláez (*eds.*) 1998. Zapatista! Reinventing Revolution in Mexico, London: Pluto Press.

Developing Countries Farm Radio Network Voices Newsletter, "Network News - Meet our Board", Winter 1997. Stated by Ian McDiarmid, Chair of the Board. [Online] Available: http://www.web.net/~dcfrn/english/publicat/voicesdo/nn98s.html

Developing Countries Farm Radio Network, "The Year in Review: 1996-1997" [Online] Available: http://www.web.net/~dcfrn/english/publicat/annual97.htm

Dieter Klee, Hans. January/February, 1997. "The Information Society The South Needs Rules and Investments" Development and Cooperation (1): 3.

Digital Partners. 2000. "Ideas and Data." [On-line] Available: http://www.digitaldivide.org/ideas.html]

Elifson, Kirk, *et al.* 1998. Fundamentals of Social Statistics Third Edition. Boston: McGraw Hill.

Economist. 1998b in Ontario Council for International Co-operation (OCIC). April 2000. Technology and Culture Knowledge Across Borders. Workshop: Leading the Edge: Engaging Ontario.

Foster, Jeremy. 1998. Data Analysis Using SPSS for Windows A Beginners Guide. London: SAGE Publications.

Fraser, Colin and Sonia Restrepo-Estrada. 1998. Communication for Development Human Change for Survival. London: I.B Tauris Publishers.

George, Nancy. 1991. "The Dilemma of Appropriate Media Selection for Dissemination of Development Information" Communication Processes: Alternate Channels and Strategies Support. Ottawa: International Development Research Centre Canada, 46-57.

Hanson, Mary. Personal informal interview. July 17, 2000

Hawkins, John and Robert Valentin. 1997. Development and the Information Age 'Four Global Scenarios for the Future of Information Communication Technology. Edited for the International Development Research Centre and the United Nations Commission on Science and Technology for Development. Ottawa: The Centre.

Ibrahim, Theyyiba. April 8, 2000. "Internet and Human Rights: Untangling the Web." Presentation at the Ontario Council for International Cooperation on Saturday.

IDC. 1999. "Internet users – a global enclave" in Ontario Council for International Co-operation (OCIC). April 2000. Technology and Culture Knowledge Across Borders. Workshop: Leading the Edge: Engaging Ontario.

IDRC. 1999. Electronic Networking for Rural Asia/Pacific. Pan Asia Networking. [On-line: http://www.enrap.org/index.ctm]

IM Europe. 1999. "Communication to the European Parliament, the Council, The Economic and Social Committee and the Committee of Regions" IM Europe IM Legal Issues. [On-line] Available: http://www.ispo.cec.be/legal/

Irving, Larry. 1999. "Falling Through the Net: Defining the Digital Divide" The Commerce Department's National Telecommunications and Information Administration. [On-line] Available: http://www.ntia.doc.gov/ntiahome/fttn99/contents.html

Jensen, Mike. December, 1998. "Internet opens new markets for Africa" Africa Recovery. 6-7.

Leal, Pablo. 1999/2000. "Communication, Participation and Technology in the Age of the Global Market" Forest, Trees and People Newsletter. (40/41): 4-8.

McNeil, Mary. 1998. "The Internet: A Plus or Minus for the Next Century?" Economic Development Institute World Bank, EDI Forum. **3**, (1): 9-10.

Melkote, Srinivas, R. 1991. Communication for development in the Developing countries: theory and practice. New Delhi: Sage Publications India Pvt Ltd.

Moemeka, Andrew, A. 2000. Development Communication in Action Building an Understanding and Creating Participation. New York: University Press of America, Inc..

Mottin-Sylla, Marfor 1999/2000. "Developing the use of information and communication technologies for women's rights" Forest, Trees and People Newsletter. (40/41): 59 - 60.

Mowlana, Hamid and Laurie J. Wilson. 1990. The Passing of Modernity Communication and the Transformation of Society. New York: Longman.

Network Wizards. 1998. "Internet users – a global enclave" in Ontario Council for International Co-operation (OCIC). April 2000. Technology and Culture Knowledge Across Borders. Workshop: Leading the Edge: Engaging Ontario.

Noa. 1999. "Internet users – a global enclave" in Ontario Council for International Co-operation (OCIC). April 2000. Technology and Culture Knowledge Across Borders. Workshop: Leading the Edge: Engaging Ontario.

Ontario Council for International Co-operation (OCIC). April 2000. Technology and Culture Knowledge Across Borders. Workshop: Leading the Edge: Engaging Ontario.

Pulsar. 2000.Pulsar Agencia Informativa. [On-line] Available: http://www.pulsar.org.ec/

Ramirez, Ricardo. 1998. "Communication: a meeting ground for sustainable development" in Richardson, Don and Lynnita Paisley (*eds.*). The *first* mile of connectivity Advancing telecommunications for rural development through a participatory communication approach. Rome: FAO, 38-59.

Richardson, Don. 1998. "The Internet and Rural Development." The Journal of Communication for development, 54-67.

Richardson, Don and Lynnita Paisley (*eds.*). 1998. "Why the first mile and not the last?" in The *first* mile of connectivity Advancing telecommunications for rural development through a participatory communication approach. Rome: FAO, 2-13.

Richardson, Don. 1998b. "Rural telecommunication services and stakeholder participation: bridging the gap between telecommunication experts and communication for development practitioners" in Richardson, Don and Lynnita Paisley (*eds.*) The *first* mile of connectivity. Advancing telecommunications for rural development through a participatory communication approach. Rome: FAO, 14-36.

Rogers, Everett.M. 1986. Communication Technology: The New Media in Society. New York: The Free Press.

Rogers, Everett, M. 1971. Communication of Innovation A Cross Cultural Approach. New York: The Free Press.

Rogers, Everett.M. 1962. Diffusion of Innovations. New York: The Free Press.

SANGONeT. 2000. SANGONeT. [on-line: http://wn.sangonet.com].

Schramm, Wilbur. 1964. Mass Media and National Development: The Role of Information in Developing Countries. Stanford: Stanford University Press.

Servaes, Jan. (1999). Communication for development: one world, multiple cultures. New Jersey: Hampton Press, Inc.

Smolan, R. 1996. 24 Hours in Cyberspace: Painting on the Walls of the Digital Cave. Toronto: Sommerville House Publishers. [On-line] Available: http:www.cyber24.com

Spore. 1997. "The Internet Alleviates Rural Isolation" Spore, (72): 1-3.

Spore. 1988. "Communication: Multiplying the message" Spore, (17): 4-6.

Surman, Mark. April 8, 2000. "Creating NGO Cyberspace: The Economics of Non-Profit Networking." Presentation at the Ontario Council for International Cooperation.

Surman, Mark. 1999. "Balancing Mission and Money: Building Sustainable Electronic Networks for Civil Society." Case studies from the Association for Progressive Communications (APC). [On-line] Available: http://www-apc.planet.apc.org/english/ngos/business/buscase/index.htm

Strauss, Anselm and Juliet Corbin. 1990. Basics of Qualitative Research Grounded Theory Procedures and Techniques. London: SAGE Publications.

Todd, Graham. April 8, 2000. "Economics, NGOs and the Internet" Participant in the discussion at the Ontario Council for International Cooperation. Participant is a professor at the University of York and owner of a company called Equilibria.

Truelove, Wendy. 1996. Internet Use in Rural Areas. Unpublished thesis from the University of Guelph: Guelph. Rural Extension Studies Department.

World Development Report and International Finance Corporation. 1999/2000 "Latin America and the Caribbean – Honduras." [On-line] Available: http://wbln0018.worldbank.org/ifcext/lacweb.nsf/866c0b7b0bad0cfe852567910056e230/18549f30451bd3c2852567da006f7330

Yoon, Chin Saik. 1996. "Participatory Communication for Development" in Participatory Development Communication A West African Agenda, Guy Bessette and C.V. Rajasunderam (*eds*). Ottawa: International Development Research Centre, Ottawa, 37-64.

APPENDIX 1

On-line Survey

SURVEY ON THE USE OF THE INTERNET

ABOUT YOU

Please answer the following questions by marking an "X" in the space provided.

a. How long have you been a member of DCFRN? _____ years

b. Are you Female___ Male_____

c. What is your primary language (as classified with DCFRN)?
English___
Spanish _____
French_____

d. Name of organization or institution

e. Mark the location where you live

North America_____
Latin Amercia and the Caribbean_____
Europe and the Former Soviet Union_____
Asia_____
Pacific_____
Africa___

f. What is your member classification?

Radio Broadcaster_____
Extensionist_____
Research/Reference_____
Teacher/Classroom_____
Partner_____

SECTION ONE

Please answer the following questions by marking an "X" in the space provided.

1. Which of the following do you use regularly?

-Telephone_____
-Fax_____
-Mail_____
-E-mail_____
-World wide web (WWW_____
-Other _____

2. Do you currently have access to the Internet?

Yes_____ (If yes, please go to #4) No_____

3. If not, do you think you will have access to the Internet:

-In the near future_____
-In the distant future_____
-Never_____
-Other _____

4. If you use email and/or the Internet, do you use it primarily for:

-Staying in touch with friends, co-workers, etc_____
-Research_____
-Getting the latest news_____
-Distributing information (sending out announcements / newsletters) _____
-Other _____

5. If you use email and/or the Internet, would any of the following make you want to participate "online" with the Network on a regular basis:

-Access to the Network's information_____
-Keeping abreast of current issues and trends_____
-Providing information to the Network and other Network members_____
-Communicating with other Network members_____
-Other _____

6. What are some of the reasons that may prevent you from participating "online" with the Network:

-Lack of time_____
-Little use of Network material_____
-Lack of resources (no computer and Internet services available)_____
-Lack of access to Internet services_____

-Do not want to_____
-Other _____
7. Do you have access to email and/or the Internet:

-All the time_____
-Most times but not always_____
-Occasionally_____
-Very little_____
-Other_____

8. If you have access but not on a regular basis, what are the reasons?

-Your own computer system failures_____
-The Internet Service Provider failures_____
-Weather problems_____
-Other_____

9. What is your general feeling about email and the Internet (in terms of communicating with other people and in terms of gaining access to useful information related to your work or own personal interests)?

10. Describe the most valuable email you ever received since you have had an email account.

SECTION TWO

Please answer the following questions by marking an "X" in the space provided.

USAGE

1. Who uses email and/or the Internet in your organization?

-Director / executive_____
-Project officer / extension worker_____
-Researcher / writer_____
-Volunteers_____
-Administration / support staff_____
-Audience (farmers, community members, teachers)_____
-Other _____

HARDWARE / SOFTWARE

1. The computer(s) I/we use for the Internet is/are:

-Pentium_____
-Macintosh_____
-486_____
-386, 286, or less_____
-Other_____

2. Do you connect to the Internet using:

-Modem 56K____ 33K____ 28.8K____ 14.4K ____
-Network (LAN)_____
-Internet Café_____
-Community Centre_____
-Office_____
-Other _____

3. Do you have access to the Internet and/or email to download and print the Network's scripts?

Yes_____ No _____

RESOURCE LIBRARY

Developing Countries Farm Radio Network is assembling a resource library of useful websites and would like your contribution.

If you use the WWW, list 3 websites that you visit regularly / find useful and give the address and explain briefly why it is a good resource:

a)Name
http://
Why?

b)Name
http://
Why?

c)Name
http://
Why?

2. Do you maintain and use an archive / library of past scripts?

Yes____ No____

2b.Would you like better access to past scripts (for example: to search for past scripts using the Internet)?

Yes____ No____

3.If you use email to contact the Network, what do you communicate? For example, evaluation of scripts, ideas for future scripts, updating information or simply to keep in touch with family, friends, co-workers, etc...?

4. Have you ever sent back a script evaluation via:

Infopoll(mail) Yes_____ No_____

Email Yes_____ No_____

4b.What benefits do you think there are in using email for feedback on scripts?

5.Do you visit the Network's website (http:www.web.net/~dcfrn)?

Yes_____ No_____

If yes, why and how often? If not, why not?

6.Would you prefer to receive scripts and Voices, the Newsletter via email or Internet instead of by mail / courier?

Yes_____ No_____ Both_____

If yes, why?

6b.How important do you think it is to receive the scripts and Voices, the Newsletter as quickly / efficiently as possible?

-Very important_____
-Somewhat important_____
-Not too important_____

If you feel it is important, why? If you do not feel it is important, why not?

6c.Would you be able to download and print scripts and Voices, the Newsletter that arrived via email or Internet?

Yes_____ No_____

6d.What type of software do you have to download the scripts?

-Microsoft Word _____ What version _____
-Word Perfect _____ What version _____
-Page Maker _____ What version _____
-Other _____ What version _____
-Other _____ What version _____

WHAT WILL THE NEW WEBSITE LOOK LIKE?

We would like your input on the components of the website. The following are some ideas. Please give us your opinion on whether each idea is beneficial or unnecessary by marking the area with an "X". If there are any terms not clearly defined, please contact us. We understand that one word could have many different names.

Idea		
Reference Library for past scripts with a search engine.	Beneficial___	Not Necessary___
Latest Script Package posted	Beneficial___	Not Necessary___
Latest Voices, the Newsletter posted	Beneficial___	Not Necessary___

Emergency or Latest News Section	Beneficial___	Not Necessary___
Members Only Section (M.O.S.)	Beneficial___	Not Necessary___
M.O.S. - Member Directory	Beneficial___	Not Necessary___
M.O.S. - Facilitated discussion (in your language)	Beneficial___	Not Necessary___
M.O.S. - Unfacilitated Chat Room (in your language)	Beneficial___	Not Necessary___
M.O.S. - Evaluation Panel (to send comments, questions, concerns and evaluation material to the Network concerning scripts, Voices or anything else in general)	Beneficial___	Not Necessary___
M.O.S. - Information Panel (to send ideas and your own contributions for future scripts to the Network)	Beneficial___	Not Necessary___
Other?		

SECTION THREE

COMMUNICATION WITH DEVELOPING COUNTRIES FARM RADIO NETWORK IN CANADA

1a.How often do you communicate with the Network office in Canada?

-1 to 2 times a year_____
-3 to 6 times a year_____
-Once a month_____
-Once a week_____
-Only when I receive a script package_____
-Other_____

COMMUNICATION WITH OTHER MEMBERS

1.Have you contributed information regarding agriculture, health and/or nutrition to the Network in the past?

Yes_____ No_____

If yes, what kind of information? If no, please see 1b.

1b.Are you aware that if you send your information related to agriculture, health and/or nutrition to the Network, other farmers around the world would be able to benefit from your knowledge?

Yes_____ No_____

2.Have you directly contacted another Network member?

Yes_____ No_____

If yes, was it someone in:

-Your town or city_____
-Your country _____
-Your continent _____
-Another country_____

If yes, what was the reason to contact that person?

2b.Have you ever been contacted by another Network member?

Yes_____ No_____

If yes, was it someone in:

-Your town or city_____
-Your country _____

-Your continent _____
-Another country_____
If yes, what was the reason the person contacted you?

3.Have you ever been in contact with another Network member indirectly (for example, via the office in Canada)?

Yes_____ No_____

If yes, give details...

4.What information do you think would be most important to share / exchange with other Network members?

5.Are you comfortable with releasing your name for the Network directory?

Yes_____ No_____

5b.Do you think it would be beneficial to have a directory of the members (who have given consent to release their information) from the Network?

Yes_____ No_____

If yes, why?

5c.Would you like to see the directory on the Network's website?

Yes_____ No_____

If yes, why?

CONSENT FORM FOR THE SURVEY

I AUTHORIZE THE NEW MEDIA PROJECT LEADERS OF THE DEVELOPING COUNTRIES FARM RADIO NETWORK TO USE THIS INFORMATION FOR THEIR STUDY ON THE USE OF EMAIL AND THE INTERNET. THIS INFORMATION WILL BE USED FOR FUTURE REFERENCE FOR THE

DEVELOPING COUNTRIES FARM RADIO NETWORK AND FOR RESEARCH PURPOSES AT THE UNIVERSITY OF GUELPH. THE INFORMATION WILL ONLY BE USED IN THE PAPERS OF CASANDRA BRYANT AND GEORGE IRISH AT THE UNIVERSITY OF GUELPH.
MY NAME WILL NOT BE USED IN THE PAPERS AT THE UNIVERSITY OF GUELPH.

Name_____

Date_____

THANK YOU FOR PARTICIPATING IN THIS SURVEY. YOUR FEEDBACK IS EXTREMELY VALUABLE TO THE NEW MEDIA PROJECT. WE LOOK FORWARD TO BEING IN CONTACT WITH YOU IN THE FUTURE!

APPENDIX 2

On-line Discussion Questions

Week One
What are your own general feelings and/or perceptions about email and the Internet?

Some suggestions are found below but feel free to comment about anything that comes to mind.

- In a global context;
- As a communication channel (with other people, organizations,etc...);
- Information access and knowledge.

Week Two
How do you feel about DCFRN as an organization in the business of producing, distributing and exchanging information?

Some questions to consider are listed below but you do not need to use them as a guideline. Please feel free to post anything that comes to mind.

- How unique is this service to you and/or your organization?
- The value of DCFRN to you and/or your organization?

Week Three
Exchange of Best Experiences

Please take this opportunity to share a best experience you have had using the Internet and/or email either in your:

-organization
-community
-research
-past or current projects

Questions to consider are:
- Why was it a good experience for you?
- Why the initiative was or is successful (what were the essential elements to its success)?
- Who were or are the beneficiaries?
- The sustainability of the best experience.
- What are some recommendations you have for DCFRN based on your best experience(s)?

Week Four
Lessons Learned

Do you have an experience to share (in your organization, community or research) where the use of email and the Internet was unsuccessful?
Questions to consider:

- What was the initial plan and outcomes of using email and the Internet?
- Why was it unsuccessful? Were there problems implementing the project, not enough resources, lack of training, miscommunication between different stakeholders?
- What have you learned from the experience(s)?
- What are some recommendations you can give DCFRN from your experience(s)?

Week Five
Radio and the Internet
This weeks discussion is focused around two communication channels - the Radio and the Internet. These two channels are increasingly being used together as a way to disseminate information by many different actors around the world.

Please answer the following questions:

- Radio is obviously the main tool of communication between DCFRN, its members and audience and ultimately, the small farmers. Do you see email and the Internet replacing the use of radio or do you see it as complementary to the radio?
- What, if any, is your experience using radio to reach your intended audience (Are you a radio broadcaster? An extension worker? A researcher?)? How effective are you in your role? Do you think your audience benefits greatly, moderately or little from the information you give them?
- If you use radio, do you have the infrastructure and access to download and utilize the programs that broadcast radio programs via the Internet? Do you know of any radio/Internet programs in your organization, community, research, other? If so, is it a successful initiative?
- Do you see the role of the Internet having a big impact on radio? Such as: - increasing your audience base - accessing new information that was never available before - a postive impact or a negative impact, and how so?

Week Six
This week focuses on training and education on the use of the Internet and email. Training and education are essential for the success of new initiatives.

Here are the questions:

- Have you participated in a workshop or course to learn how to use the Internet and/or email? If yes, please tell us about it. Did you benefit from the experience?
- Have you hosted a workshop or taught a course on how to use the Internet and/or email. If yes, please tell us about it. What skills are the most important to have?
- Do you think DCFRN should provide information on how to use the Internet and email? Should the information be posted on the website and/or a part of Voices, the newsletter and/or part of the script packages?

Week Seven
Describe the most valuable email you ever received.

APPENDIX 3

Personal Interview Questions in Honduras

1. How long have you or your organization been a member of DCFRN?
2. What is your profession?
3. What is the estimated size of your audience or beneficiaries?
4. How unique is DCFRN and its services? Are there other organizations similar to DCFRN?
5. How valuable is the material you receive from DCFRN (do you use the information on a regular basis)?
6. In what ways have you used the material from the scripts? Do you have any examples?
7. What other sources of information do you use in your work? For example, if you need agriculture market information do you use sources at the local, regional, national or international level?
8. Do you have access to the Internet and/or email only or not?

8a. If yes, then:

   a. What do you use the Internet for – why do you have it?
   b. Who do you communicate with on a regular basis?
   c. Do you use information from the Internet in your work?
   d. Describe the most useful/valuable email you ever received.
   e. What are some positive experiences using the Internet?
   f. What are some negative experiences using the Internet?
   g. Have you ever visited the DCFRN website?

8b. If no, then

   a. Will you have access to the Internet and/or 'email only' in the future?
   b. Do you think it is important to have access to the Internet? Why or why not?
   c. How do you communicate with your beneficiaries/audience?
   d. How do you gather information relevant to your work?

9. Are there any resources you would like me to bring back to DCFRN (local, regional)?

APPENDIX 4

Informal Interview Questions with DCFRN

1. Can you BRIEFLY explain how you see the Internet and e-mail playing a role in the future and how it might enhance your small "partnerships" with each member.

2. Please include any thoughts on how DCFRN would like to become a "clearing house" of information amongst the members instead of generally the sole source of providing information (the top-down distribution process) to members.

3. Do you vision a network of members where they are providing and exchanging information and where they might begin to create partnerships of their own by learning about each other through this network? Or do you have a different vision?

4. Do you think creating an on-line network is the best means to achieve this?

5. What is the current status of information gathered on the use of technology for the organization? What stage is DCFRN at with the comprehensive technology strategy?