A pilot project for the development of guidelines towards the establishment of a telecentre in a rural agricultural community in South Africa

by

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PREFACE

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CONTENTS

CHAPTER I - INTRODUCTION

Universal access is a means to promote economic growth and development, consolidate democracy and human rights, and increase the capacity of ordinary people to participate in governance

\- ***South Africa's former president, Nelson Mandela.***

Synopsis

In this chapter, the background of the study with the explanation of the value adding model is given. The problem statement, which comprises the lack of case studies on how to implement a telecentre in order to address the specific needs of a rural agricultural community, is explained. The aim of the study, which involves research on the information needs of the community, how information should be made available in order to address these needs and what technologies should be used, is described thereafter. This is followed by an exposition of the research hypothesis, which is based on the fact that it is possible to develop guidelines towards the establishment of a telecentre in a rural agricultural community in South Africa. The nature of research is described, followed by a description of the literature study and the practical implementation of the pilot project. The research group is then described. The definition of terms comprises an explanation of 16 terms applied in this study. Thereafter, the literature study is explained, the research procedures are given, followed by a short extract of the interpretation and recommendations, which are discussed fully in the last Chapter. This is followed by an outline of the structure of the study as a whole.

1.1 BACKGROUND

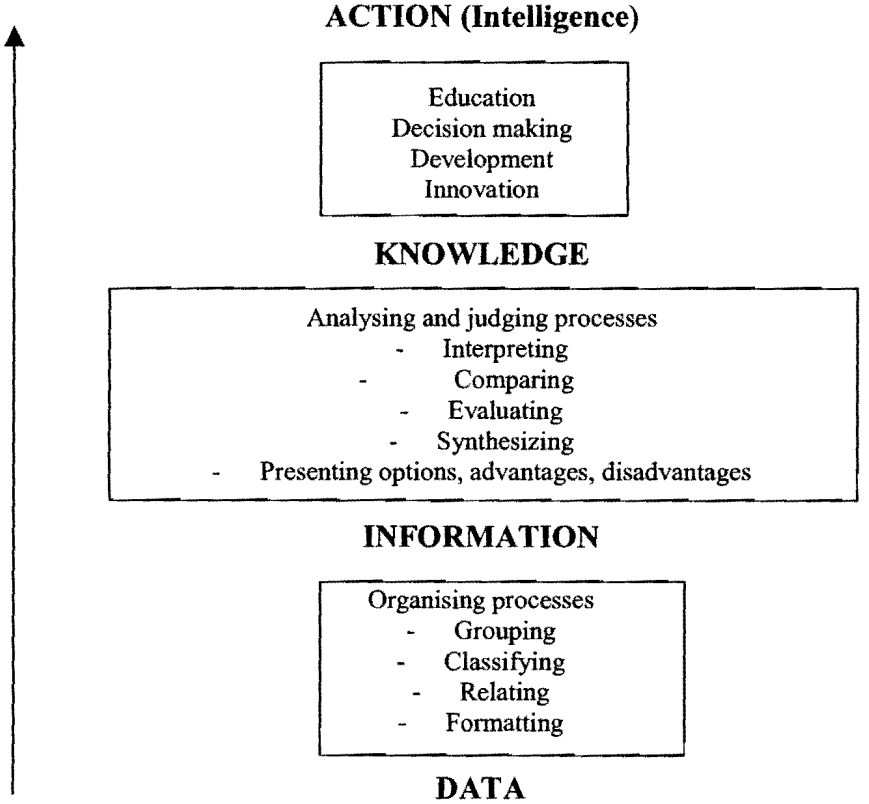
Thabina is a rural, farming community in the Northern Province of South Africa that has recently established a WUA (Water Users Association). They would now need information on farming and irrigation practices, and would now also have to communicate with other WUA's and with other agriculture-related organisations.

This pilot project was undertaken in order to develop guidelines towards the establishment of a telecentre for this farming community at Thabina, by which means the farmers could obtain agricultural related information in order to address their specific needs. They needed information on irrigation methods, land care, mechanisation, etc., and to communicate with other agriculture-related organisations.

This is a research and pilot development project at Thabina. The first phase of the pilot project was the preparatory phase and comprised a background study on telecentres, as well as the necessary information needed for the establishment of a telecentre. It was foreseen that the telecentre could be established in the existing building, but it had to be secured first. A manager was also appointed by the Department of Agriculture, Land and Environment.

It had then to be established what kind of information would be needed by the Development Committee. It was foreseen that the type of information needed from the centre would at first be agriculture-related information, and that afterwards the centre would be developed into a multipurpose centre where information on tele-medicine, tele-schooling, etc., could also be obtained. The question was, what would be necessary to uplift the social and cultural activities of this rural agricultural community in South Africa by means of the establishment of a telecentre? Very little information on this topic is currently available and with the pilot project it was envisaged that research could be done in order to find solutions on how to develop the rural agricultural community by the value adding model (Boon, 1992) - where data is converted into practical, applicable information that could lead to knowledge that leads to action - the obtaining of the knowledge by means of a telecentre:

Value adding model (Boon, 1992)



These value-added processes have as their purpose the promotion of data to information, to knowledge to actions, actions such as *decision-making and development* (Boon, 1992):

Data are facts and concepts, normally structured according to some or other method of organisation.

Information is regarded as data in an appropriate and usable form and is regarded as a homogeneous entity. What might be regarded as information by one user in a particular situation, could be data for another user and knowledge to the third.

Knowledge is information processed by an individual or group within an existing knowledge with a view to appropriate actions.

Intelligence is the ability of an individual to adapt to the demands of the environment in a coherent manner.

Development can be regarded as a process, a condition or a combination of the two. Sometimes development is also seen as synonymous with modernisation or transformation. There are three core values of development:

- sustaining life (ability to provide basic needs)
- self-esteem (personal growth)
- freedom from servitude (ability to choose)

Development may be described as a complex process that to a large extent depends upon the internal, innovative capabilities of individuals and the community, in a context of established norms, opinions and values. Development can also be stimulated, facilitated and funded by external communities and individuals. Development has its basic origin in the calling which God gave to man, namely, to manage his creation. Development includes socio-cultural, educational and economic change, to name just a few. It is primarily concerned with the wellbeing of people – for example, in a material, cultural and religious sense. It entails quantitative and qualitative change and progress: sustained improvement in the standard and quality of life.

The pilot project was initiated at the beginning of 2000, after the WUA had been established. Workshops were held with the Development Committee appointed by the community. During these workshops, it became clear that the farmers needed the information to be obtained from the various technologies to address their needs. As explained in chapter IV, approval had to

be obtained to commence with the pilot project, and afterwards the pilot project was executed according to the various phases.

1.2 PROBLEM STATEMENT

There currently exists a lack of case studies on how to make the necessary information available to a rural agricultural community in order to have self-sustainable development. It is possible that the real and identified needs of a rural community could be addressed by the applicable communication tools offered by a telecentre. There are, however, no existing guidelines for the introduction of these tools through a telecentre serving a South African rural agricultural community.

The pilot project was undertaken in order to determine whether the information needs of the rural community at Thabina could, by means of ICTs, provided by a telecentre, be sufficiently addressed.

Although various telecentres have been implemented nationally and internationally, the reason for the failure of most of the current established telecentres in South Africa (by the USA), is that they were established as 'boxes from the sky' – which means that no surveys of the real needs of the specific communities were made beforehand and telecentres were often imposed on the local community .

1.3 THE AIM OF THE STUDY

The primary reason for this study was to define directives, or guidelines, for the establishment and the infrastructure of the establishment of a telecentre in a rural agricultural community in South Africa.

It was the aim of this research project to determine:

- The specific information needs of the community of Thabina and,
- if addressed, would enable them as a Water Users' Association (WUA), to become self-sustainable.
- How information could be made available to them and in what form it should be introduced to be understood by this mostly illiterate community; and
- Which technologies should be introduced to the community, i.e. appropriate technologies to obtain the necessary information to become self-sustainable and to address their specific needs.

1.4 RESEARCH HYPOTHESIS

It is possible to establish a successful telecentre in a rural agricultural community in South Africa on condition that community ownership is established from the beginning by means of personal stakeholder involvement. This is possible only with knowledge of Development Support Communication (DSC); sufficient knowledge of the information needs of a specific community; and the necessary knowledge on how to obtain the desired information from a variety of technologies in order to address these needs of the community.

1.5 NATURE OF RESEARCH

The research project comprised a survey among stakeholders, interviews and participant observation of the interaction between role-players during workshops. The methodological perspective can be described as broadly qualitative – allowing the voices of the participants to be heard during the research.

It also comprised a literature study on DSC and related communication paradigms, as well as the steps to be taken in order to establish a telecentre in a rural agricultural community in South Africa. Research methods comprised participant observation during the workshops held, as well as personal interviews with the members of the Development Committee.

The Researcher, by means of participatory communication and observation, made sure to obtain the opinions of the members of the Development Committee on the establishment of a telecentre in their community. The questions asked and interest shown in the pilot project indicated that there was undoubtedly a need for purposeful communication. Practitioners should be involved in preparing media campaigns (which medium for what kind of information to be disseminated) that will address the information component of development needs, (thus) audience characteristics, and our knowledge of them are central topics in what is generally called social marketing (Burton, 1998:89).

1.6 METHODOLOGY

1.6.1 Literature search

A literature study was done that touched a number of fields, namely information science and development communication, telecommunications and information science essential for the establishment of a telecentre. In other words, whether

applicable information could be obtained from the technology provided by a telecentre, in order to develop a rural community towards self-sustainability.

1.6.2 Field work

Research field work was conducted by means of interpersonal communication, based on the DSC paradigm, and it comprised interaction with stakeholders, participant observation and personal interviews, as well as demonstrations to the Development Committee of the various technologies. Applicable information obtained from these technologies could address their identified information needs. Field work was an empiric survey of community needs, stakeholder involvement and existing and future infrastructure.

1.7 RESEARCH GROUP

The pilot project was aimed at the farming community of Thabina, situated near Tzaneen in the Northern Province of South Africa. The irrigation scheme of the farmers of Thabina, was identified by the Director of the Department of Agriculture, Land and Environment as one of the irrigation schemes to be upgraded and rehabilitated so that the community to which the scheme belongs, could become self-sustainable. In order to get access to the subsidy scheme for farmers from the Department of Water Affairs and Forestry (DWAF), these farmers had to establish a new order at their irrigation scheme, namely a WUA. This subsidy scheme from DWAF is allocated for bulk infrastructure, such as canals, weirs, pump stations, pump lines and various other agriculture-related issues, needed for sustainable farming.

There are 42 female farmers and 95 male farmers. The predominant ethnic groups are Shangaan (110 farmers) and Sotho (26 farmers). The average age of the farmers is around 60 years and the average number of people per household is 9. The illiteracy rate is 45%. Farming is done by the farmers: 61% full-time and 39% part-time. The major income of the community is pensions, income from formal employment and the sale of farm produce. The sizes of the farms vary between 1 ha (104) and 5 ha (4). The standard of agriculture practiced is sub-subsistence to subsistence – farmers rely on other sources of income to survive.

1.8 DEFINITION OF TERMS

1.8.1 Information

According to Leach (1999:77), information needed at the telecentre for practical implementation is not something which one party gives to another party. It is

interactive, where the rural adults are seen as providers of information themselves – information is shared and the oral format in a workshop situation lends itself thereto, whereas, with verbal communication, it becomes easier for people to get the message. When information is interactive, it is shared by the developer and those to be developed, as the developer has new information and those to be developed have their own information on practices ("how things are done now").

1.8.2 Communication

According to Mody (1991), the word "communication" comes from the Latin "communis", that is "common". The aim of communication as an outcome is to "make common", to share. Communication is achieved when the sender and the receiver have common meaning, that is, when the meaning the sender wants to share is identical ('isomorphic' with) to the meaning the audience receives. Rogers (1995) defined communication as the process by which two or more people share knowledge so as to arrive at a common understanding.

Communication is also defined by Nair and White (1994:155) as a "two-way process of convergence, rather than a one-way, linear set in which one individual seeks to transfer a message to another". Communication is often used as within the first type of the two types of definitions of communication identified by O'Sullivan *et al* (1994:50): "The first sees communication as a process by which A sends a message to B, upon whom it has an effect. The second sees communication as a negotiation and exchange of meaning in which messages, people-in-cultures and 'reality' interact so as to enable meaning to be produced or understanding to occur". The pilot project was based on the latter.

The interpersonal process of communication is basically represented by the following, where S is the sender, M is the message, and R is the receiver.

$$\mathbf{S} \longleftrightarrow \mathbf{M} \longleftrightarrow \mathbf{R}$$

Persons who are visible and/or audible to each other (or both) can take turns at being sender or receiver as they converse. The arrows going both ways show that the sender and receiver can modify the message until it conveys the meaning they intended. It is

therefore the needs and preferences of the audience, which should dictate how the producer designs media messages. It is important that both parties in the communication process acts as the receiver, as well as the communicator of messages – this is how mutual understanding is established by means of feedback.

1.8.3 Development Communication (DC)

DC is described by Malan (1998:51) as all forms of communication that are used for the improvement (such as social upliftment by means of capacity building through training) of an individual, community, or a country's material, cultural, spiritual, social and other conditions. Culturally, the areas of development and communication will overlap to the extent that both involve processes of making sense, giving meaning, reaching goals, improving and finding solutions, creatively changing the environment, and creating visions based on values and beliefs.

1.8.4 Development Support Communication (DSC)

DSC is a strategy for reaching specific groups of people with new ideas, information, and technologies to get rural communities to participate in development programmes. In the comparative table of Jayaweera and Amunugama (1989:60) it is pointed out that DSC differs from DC in the following respects: DSC applies to micro or local entities, it is goal-orientated and concerned with effects, time bound, message-orientated, uses a whole range of culture-based media, is invariably interactive and participatory and it has gained enormous credibility.

DSC is communication that is specifically designed to support a particular development programme. It can therefore work effectively within its limited sphere, even in the absence of DC throughout the rest of society. Within DSC the negotiation and exchange of meaning of culturally determined interaction is of primary importance (Jayaweera, 1987:xviii).

1.8.5 Participatory communication (PC)

Participatory communication is a means to help establish or enhance dialogue and interaction among people who share concerns about issues and problems. The basic tenet of participatory communication is that the communication process is more important than the production of media products (Richardson, 1997). UNESCO also defined PC in 1978 as the social process in which groups with common interests

jointly construct a message oriented to the improvement of their existential situation and the change of the unjust social structure (in Mody, 1991:30).

1.8.6 Sustainable development

"Basically it has to do with democracy, with participation, with spreading of knowledge and insight and ability to take care of our future" (Fraser and Villet, 1994:1). According to Agunga (1998:29), it embraces issues like participation, integration, collaboration, delegation, linkage, co-ordination and teamwork – all of which imply communication.

1.8.7 Telecentre

The term telecentre has been used to describe a broad range of services, including commercial call centres, satellite offices with facilities (e.g. fax, telephone, computing, Internet) use. Bagley *et al* (1994) notes that in the United States the term telecentre often refers to a "telecommuting centre", in other words, a location (usually urban) where workers can work by using telecommunication technology to keep in touch with their main offices. When used in this sense, a telecentre is the same as a "tele-work" centre; - a centre that helps telecommuting by bringing the work to the workers, instead of vice versa (Campbell, 1995a).

For the pilot project, however, the term telecentre will comprise the following - characteristics of both a Multi Purpose Community Centre (MPCC) and an USA telecenre, as based on the paper by Benjamin *et al* (2000).

- **Location**:

  The telecentre should be, like the MPCC's and USA telecentres, located in a formal building that is durable, provide protection to equipment and is more spacious to allow for the possibility of expansion of facilities. It will therefore be accessible to the community and become associated in the minds of users with other resources.

- **Infrastructure**:

  A typical centre should be well equipped with a variety of equipment and offer a wide range of services, from telephony to fax, photocopying, Internet and other computer-related services such as the creation and printing of CVs and documents for the WUA, as in the case of the pilot project. Whereas MPCC's

equipment is usually relatively new, the equipment for this centre should be bought second-hand, due to a lack of funds. It is foreseen that all this equipment would be used to their full, as the equipment was identified by the Development Committee as applicable, in order to address their information needs. Although training would be provided to the Manager only, it was foreseen that this Manager could train the rest of the users. Unlike the USA telecentre, the equipment of this centre should be insured and have adequate protection. One of the lessons learned from Benjamin *et al* (2000), is that there is a great demand for telephony, which is why it was foreseen that at least four telephones should be installed in this telecentre.

- **Staff**:

The owners and managers of Vodacom shops reflect a more uniform grasp of business, and although the USA provides training, the manager, or intermediary of this telecentre, should, in the case of Thabina, be trained in business and in computer literacy by the Researcher. The strength of the management should lie in the managers' understanding of the local community and his/her vision for growth and expansion in terms of impact on the local community.

- **Ownership**:

Like both the USA telecentres and the MPCCs, this telecentre should be community owned by the Development Committee, appointed by the community itself. The community should then be able to drive its own upliftment through the opportunities presented. As with a community owned MPCC, the provision of services could be hindered through the lack of funding.

- **Users**:

The facilities and services should draw users from different age categories and occupations. Although non-telephonic equipment is rarely used, it was foreseen that the users should make ample use of the fax, computer and the Internet. The users of the MPCC are often unable to afford the cost of many of the services (Benjamin, 2000), and it was foreseen that this might also be a weakness in this telecentre.

1.8.8 Management

Management is probably the most important issue to receive attention in the process of establishing a telecentre – they will inevitably lack experience and training (Malan, 1999:6). If not computer literate, a manager can be seen as a person(s) to be trained, to translate the media messages into an understandable, digestible (indigenous) language, as most of the members of the community in a rural area, would be (computer) non-literate. During the research for the pilot project, it became apparent that only one of the members of the Committee was computer literate. Although the manager appointed was not computer literate herself, she was more than eager to learn the operation of the various technologies. As she was dedicated, it was foreseen that she would be able to teach the other members of the Development Committee how to operate the computer, fax and photocopier. Training will be necessary in all stages of telecentre projects – not only to the manager, but to users by the manager … in order to upgrade skills as technical and content requirements change (Anderson *et al*, 1999:4). As Richardson (1997:2) mentioned, there also needs to be a focus on training of the manager and commitment to spend money on it both in the short and long term.

1.8.9 Community

A community telecentre is essentially a commercial facility serving a rural region … located in a village situated in the centre of the region (Ernberg, 1999:9). The 'community' telecentre attempts to generate a public good but eventually the telecentre can and should charge fees for its services. The relationship that the 'community' telecentre has to the private sector is three-fold:

- Business people can use the facility and develop new skills and services there.
- They can also use the infrastructure to develop products and services that add value to the investment made in technology and people at the telecentre.
- Lastly, the community telecentre functions as a conditioning program or a 'market maker' for the private sector to eventually develop their eventual entry into the marketplace (Fuchs, 1999:3).

1.8.10 Rural community-orientated telecentres

These are centres that are situated in rural areas and that provide local rural communities with access to ICTs. Usually these centres have training as their main activity, but they may also provide information technology-based services (Conradie, 1998:103).

1.8.11 Modernisation

Modernisation is conceived here as a process of diffusion whereby individuals move from a traditional way of life to a more complex, more technically developed and more rapidly changing way of life. But this is a top-down process, where the developer gives the information to the passive recipients. There is a shift, though, observed by Servaes (1995:39) from modernisation and dependency theories to more participating and normative holistic approaches. Although it was the aim of this project to 'modernise' the community of Thabina, information was shared in a participating manner.

1.8.12 Attitude

Attitude is a relatively enduring organisation of beliefs about an object or situation predisposing one to respond in some preferential manner (Rokeach, 1966:530). According to Agunga (1998:30), (only) when a community develops a vision, it will find the resources to meet its goals. Throughout the workshops on the introduction and explanation of the term telecentre and the demonstration, which were both conducted interactively, the attitudes of the members of the Development Committee, to whom the various technologies were demonstrated, were perceived to be one of interest. It could be said that they were open-minded towards the new information communicated to them.

1.8.13 Attitude change

Attitude change would be a "change in predisposition, the change being either a change in … a structure of beliefs, or a change in the content of one or more of the beliefs entering into the attitude organisation" (Rokeach, 1966:530). As only one of the Development Community's members were au fait with the computer, the rest of them had to be convinced that the technology could assist them greatly in becoming informed on the various applications of agricultural information, in order for them to become a progressive society.

1.8.14 Access

Access refers to the availability of media for public service. It may be defined in terms of the opportunities available to the public to choose varied and relevant programs and to have a means of feedback to transmit its reactions and demands to production organisation (Servaes, 1995:46). It was presumed that after the implementation of the planned project, the community would have access to the various technologies.

1.8.15 Participation

Participation implies a high level of public involvement in communication systems. It includes the involvement of the public in the production process, and also in the management and planning of communication systems. Right through the pilot project, the members of the Development Committee, to whom the technologies were introduced and demonstrated, were interested in the information. They wanted to participate in becoming an information-rich community, as the essential information was made available to them by means of the pilot project.

The Researcher made a study of the technologies to be demonstrated and the information to be obtained from the technologies. After the needs assessment, the Researcher decided on the information that would be essential to address the information needs of Thabina, as "it is better to start with a specific development problem and the context in which the problem is to be addressed, and from there to decide on the most appropriate technology to be used" (Denbigh, 1994, as described by Campbell, 1995a).

1.8.16 Verbal interaction

Verbal interaction is described by Leach (1999:84) as a communication process where reaction, comment and discussion would take place. The pilot project was based on verbal interaction. During the workshops held, the opinions of the Development Committee were aired and verbal interaction took place among the various role-players.

1.9 LITERATURE STUDY

To ensure a sound understanding of DSC and telecentres, an extensive literature study on telecentres, involving international and local telecentre models and guidelines, was undertaken. This was done using the Internet (various Web sites and e-mail to correspond

with various persons in development communication) and the Information Service of the University of Pretoria. The appropriate selected literature on telecentres was thereafter studied and analysed in the context of the role and function of telecentres, international and local. Although the Universal Service Agency (USA) has done extensive pioneering work and has compiled a manual for the establishment of a telecentre, no literature could be found on the establishment of a telecentre in a rural agricultural community in South Africa. But a huge amount of information that could be demonstrated to the illiterate community of Thabina, was obtained from the Internet and various Web sites (see chapter on the demonstration of the various technologies and the information to be obtained from these technologies).

1.10 RESEARCH PROCEDURES

This aspect is described comprehensively in chapter V on page 94.

Personal interviews and workshops was based on participant observation:

- during the **preproduction audience phase,** where the letters to obtain permission to establish the telecentre, and the meaning of the telecentre was explained as well as where the background was sketched of how the telecentre would fit into their management of the WUA;
- during the **implementation phase,** with the demonstration of the various technologies.

1.11 INTERPRETATION AND RECOMMENDATIONS

Chapter VI is devoted to interpretations, conclusions and recommendations. Aspects discussed are the participatory communication process, time-related issues, the needs assessment, the demonstration of the various technologies and the workshop situation.

1.12 STRUCTURE OF THE STUDY

Chapter I comprises the problem statement, aim, hypotheses, nature and methodology of the research project. A definition of terms follows, followed by information on the literature study, analyses procedures and interpretations. In chapter II an exposé of the challenges in DC is presented, including the extension of the Information Superhighway to Africa. Thereafter the role of ICT in agriculture in South Africa is discussed, focussing on the role that telecentres might play in providing these ICTs. Chapter III deals with the preparatory phase in the establishment of a telecentre in a rural agricultural area in South Africa. Chapter

IV deals with the actual implementation of the pilot project planning at the rural agricultural community of Thabina. The evaluation of the core elements of the pilot project is described in chapter V, and chapter VI contains the interpretations, conclusions and recommendations of the pilot project. Lastly, before the references, the abbreviations used are explained.

CHAPTER II - CHALLENGES IN DC

Synopsis

In this chapter, the paradigm shift from DC to DSC is explained. Communication as a mediation tool which brings different social groups together, as well as development, telecommunications and information as a continuously growing resource are discussed.

The various ICTs and DC are looked into and the communication tools such as the Internet, telematics and ICTs are explained. The question of the possibility to extend the Information Superhighway to Africa, including problems and solutions, is discussed. Afterwards ICT in agriculture in Africa is explained, and the discourse is then narrowed down to ICT in agriculture in South Africa as such, with the role that telecentres might play in bridging the gap between the 'haves' and the 'have nots' of ICT, or the information rich and information poor, as described by Britz and Blignaut (1999:115).

2.1 OLD VERSUS NEW PARADIGMS IN DC

New information technologies continue to offer great opportunities for African countries in accessing information needed for development from the industrialised world with greater ease and at a lower cost (Alemna, 1999). The dramatic acceleration in the development and use of ICTs during the last few years has set in motion a worldwide process of transition from the Industrial to the Information Society.

Since its inception, DC has been a dynamic discipline, evolving and adapting to new development paradigms. In the past, development approaches were top-down and based on economic development and the transfer of technology and information. Today, participatory and people-centred development approaches are used - such as DSC. A variety of communication models and approaches have been developed in the last 25 years. Now researchers in DSC can draw upon the lessons learned to use communication technologies, methodologies and techniques in the most effective manner to promote sustainable development efforts and to adapt to changing societal needs. "Village communities need to be empowered so that they can be in a position to put forth their ideas as 'equal' actors in the process of development planning, design and execution" (Malan, 1996:18).

The major challenges facing the world today include managing the environment in a sustainable manner, managing the exploding rate of population growth and urbanisation,

ensuring food security, meeting health, education and literacy needs and eliminating poverty (Malan, 1996). Meeting these challenges requires information, knowledge and a participatory process of social change, and communication is an essential element in this process. Establishing a dialogue with people can empower them to take decisions for their own development. Communication is essential in order to increase participation, provide information for change and innovation and help in the sharing of knowledge and skills (Balit, 1996:1). As old as the concept of communication might be, dating back to the inception of mankind, there are as many theories today relating to it. For the development sphere, the concept of DSC has been established.

2.1.1 A paradigm shift in communication strategies: DC versus DSC

The 1980's have seen what is sometimes called a paradigm shift, described as a movement, from the concept of DC with its emphasis on top-down, big-media-centred government-to-people communication to DSC, focusing on co-equal, little-media-centred, government-with-people communication. Moreover, the situation is complicated by the theoretical upheaval following the 'paradigm shift'. In his survey of international research, Halloran (1987:146) describes critical scholars' "dissatisfaction and concern at the lack of progress, confusion, etc., in development communication ...". This might well be due to the fact that communication took place according to the top-down DC paradigm – if it is taken into consideration that the DSC paradigm was initiated in later years only.

What are the differences between these two often used theories - the Development Communication (DC) and the Development Support Communication (DSC) paradigms? Why is the one acknowledged as 'old' (DC) and the other as 'new' (DSC)? These two theories have vast differences which are compared according to the following categories (Malan, 1996:16 and Servaes, 1995:48):

Development Communication	Development Support Communication
Source:	
University-based	Development Agency-based
Structure:	
Top-down, authoritarian	Horizontal knowledge-sharing between benefactors and beneficiaries
Paradigm:	
Dominant paradigm of externally directed social change	Participatory paradigm of an endogenously directed quest to maintain control over basic needs
Level:	
International and national	Grassroots
Media:	
Big media: TV, radio and newspapers	Small media: video, film strips. Traditional media. Group and interpersonal communication
Effects:	
To create a climate of acceptance by beneficiaries for exogenous ideas and innovations	Create a climate of mutual understanding between benefactors and beneficiaries

2.1.2 Communication as a mediation tool

Communication is a mediation tool which brings different social groups together to discuss their interests and needs to reach a consensus for action. Communication technology and media are useful tools in this process, but should not be considered as an end in themselves. Sustainable people-orientated development can only be realised if information and knowledge are shared and beneficiaries are involved and motivated. This indicates that "the essence of involving rural people in their own development lies in the sharing of knowledge. Sharing is not a one-way transfer of

information; it implies rather an exchange between communication equals. On the one hand, technical specialists learn about peoples' needs and their techniques or production; on the other, the people learn of the techniques and proposals of the specialists" (Balit, 1996:5). He also said that DSC efforts begin by listening to people and taking into account their perceptions, needs, knowledge, experiences, cultures and traditions (1996:6).

2.1.3 Development and telecommunications

The question should be asked whether the Information Superhighways are perhaps becoming a more important part of the infrastructure than ordinary highways (Ernberg, 1999:2). The vital importance of telecommunications for economic, social and cultural development is clearly established. No economic, social or cultural development can occur without telecommunications - but it should be implemented in a participatory manner - according to the needs of the particular community (Ernberg, 1999:5).

The rapid development of IT and telecommunications in industrialised countries threatens to leave the developing countries even further behind, while, ironically, the information-intensive service sector is a sector where developing countries could compete successfully with advanced countries. This is because information is a global entity – connecting by means of telecommunication ensures the provision of information, globally available, whether you are from a developed or developing world. This is evident, for example, by the increasing number of information processing jobs, outsourced by transnational companies to developing countries, but only to localities where adequate telecommunications are available (Ernberg, 1999:3, Agunga, 1998:20 and Anderson *et al,* 1999:3).

2.1.4 Information as a global resource

It should be borne in mind that information is not only a non-polluting and renewable, but also a continuously growing, resource (Ernberg, 1999:3). Today, information is increasing: instant contacts between millions of people through computer networks trigger chain reactions, not unlike nuclear reactions. Access to this global resource is becoming the driving energy of development, and is as important as access to roads and to electrical power. IT and global telecommunication and computer networks will have the same, if not greater, impact on society, as the invention of electricity. In the

rich world it will soon become as cheap and easy to plug into the global information resource when one needs to know something, or wishes to share knowledge with someone, as it is to connect to and use electrical power to shave or vacuum (Ernberg, 1999:3). According to Britz and Blignaut (1999) the concept of information poverty and richness are closely associated with the concept of information technology. The nations that have adopted and applied new innovations in technology have a competitive edge over their rivals. The existing disparities in wealth and standards of living between nations of the developing world and the developed world, is, according to them, to a large extent a function of technology (1999:112). According to them, information poverty is caused by reasons such as the unavailability and inaccessibility of information, the inability to give substantial meaning to available information and specific information environments (1999:116). They therefore describe the prerequisites for information health as education (cognitive abilities to give substantial meaning to information), information literacy to be obtained through information literacy programmes (the ability to know when someone needs the information, identify and find the needed information, evaluate the information, organise and use it) and the availability of essential information (availability, usefulness and accessability of information which is needed for development) (1999:116).

2.2 INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) AND DEVELOPMENT COMMUNICATION (DC)

It is generally accepted that the emergence of new ICTs is contributing to the creation of a new 'information society' that heralds profound changes in many walks of life (Conradie, 1998:99, Burton, 1998:90, Beyers, 1996). It is also apparent that there are both opportunities and threats inherent to this emerging communication dispensation. For developing countries the question that should be afforded high priority is not whether they should participate in the Information Society, but rather how information technologies can effectively be applied to development. The importance of information in the development process is increasingly recognised, not only by those involved in development work (Leach, 1999:71; Andreasen, 1995:316 and Louw, 1995:58), but also by the potential recipients of such information:

> We (peasants in Burkina Faso) want to be informed because we have information needs … We know that the problems we face are faced by people elsewhere. People have found solutions to these problems, but we are not aware of the solutions found … What should

we do to find information? We desire that the institutions that work with us help us to find approaches and structures that can satisfy our information needs (Leach, 1999:71).

As indicated above, "there are needs for telecommunications in rural and remote areas but there is not yet a market" (Ernberg, 1999:10). It is also generally accepted that the emergence of new ICTs are contributing to the creation of a new "information society" that heralds profound changes in many walk of life (Conradie, 1998:97). Clearly, access to advanced telecommunications has little meaning unless people have a use for such tools. This means that the introduction of telecommunications in rural areas must be done as part of a concerted effort by all concerned sectors to develop a rural community or region, for example by means of (Ernberg, 1999:10):

- Supporting and diversifying local economic activities (e.g., by promoting the creation of co-operatives and small enterprises);
- Improving social conditions (e.g., health care, social security, etc);
- Improving access to education, vocational training and culture.

2.2.1 Development and the knowledge industry – historic tendencies

Information is vital to participation and empowerment, and is an essential resource for building knowledge, engaging in dialogue and decision making (Burton, 1998:94). Research in information and communication technology has shown that information technologies play a potentially significant role in socio-economic development (Mukasa, 1998:7; Malan, 1996; 1998; and Rogers, 1962:99).

Access to telecommunication networks are becoming a high priority in developing countries, especially in the rural areas, where the majority of the population lives. It is regarded as an excellent way of bringing telecommunication to these areas. Over the last couple of years, numerous initiatives in the area of infrastructure development and applications have been launched by the South African government in order to implement its vision of an open democratic society (Snyman & Snyman, 2000:3-6). To list but a few:

- The promulgation of the *Telecommunication Act no. 103 of 1996.* The Act provides for, among other matters, the establishment of an independent regulator, the South African Telecommunications Regulatory Agency (SATRA), responsible for licensing monitoring. The Act established the

Universal Service Agency (USA) responsible for ensuring universal access to all telecommunications service.

- In May 1997, Telkom was given a license which stipulated that Telkom has to provide a total of 2,81 million new access lines in 5 years.
- The Department of Communications has launched Info.com 2025, a collection of short- and long-term projects which, collectively, are intended to establish a networked information community that empowers people in the way they work, live, and play and to make South Africa globally competitive.
- A Task Group on Government Communications (Comtask) was appointed in December 1995 to investigate and make recommendations about government communication and its structures, media-ownership and control, the relationship between Government and the civil society. The Comtask report strongly supported the establishment of Multi-Purpose Community Centres (MPCC's) which can disseminate useful information about Government and other matters.

(The ideal is that) messages are not simply transmitted from authorities to passive recipients, but are part of a dialogue where both the sender and receiver of information are engaged in constructing reality and generating new knowledge from the existing technical, scientific, and experimental knowledge (Mukasa, 1998:5).

Demonstrations of the various technologies

It is therefore important to note that the technologies and information to be obtained from these technologies, should be demonstrated to the community, in order for them to become familiar, with not only in the use of the technologies, but also of the application of the information received from these technologies. "Barriers found in traditional society can be 'removed' through … mechanisms: through demonstrations, whereby the developing world tries to 'catch up' with the more developed by adopting more advances methods and techniques …" (Servaes, 1995:40). As the demonstration is based on oral communication and, if taken into account that most developing communities are illiterate, oral communities, the demonstration could be the solution of bringing the developing community in contact with the various ICTs when demonstrated to them.

The expression "Give a person a fish and the person will eat for a day; teach a person to fish, and the person will eat for ever", could be applied to environmentally sustainable

development - a man develops himself by what he does: he develops himself by making his own decisions, by increasing his knowledge and ability and by his full participation in the life of the community he lives in. A good example of participatory development is the Rural Women's Association at Apel, a small hamlet four hundred kilometres north of Pretoria, that had nothing and was forced to ask questions like 'What is the solution? What should we do next?' Knowledge can be increased by exposing a person to the information that can be obtained from the ICTs by means of a demonstration – information that can assist him in the developing process (Boon, 1992:64-65).

Demonstrations of the various technologies at village level in countries around the world are showing how people of all ages and all levels of education – including particularly, poor and illiterate people – can use these technologies. These examples include application for education and training; for diagnosis of human, animal, plant, soil, machinery and other ailments; management by communities, small businesses and local governments; physical resource planning and environmental management at local levels and rural credit and savings (Woods, 1996, Wyley, 1995:7 and Servaes, 1995). These initiatives demonstrate the potential of the technology for empowering people for their own development.

Bridging the gap by means of the technologies

The central problem of development was thought to revolve around the question of 'bridging the gap' and 'catching up' by means of imitation processes between traditional and modern sectors, between retarded and advanced, information rich and information poor (Britz and Blignaut, 1999) or between 'barbarian' and civilised sectors and groups to the advantage of the latter – in a natural urge towards equilibrium (Melkote, 1991:265 and Agunga, 1998). The technologies to achieve this major advance, already exist in the communication capabilities of broadcasting, telephony, cable and satellites; the processing and interactive abilities of computers; prodigious electronic storage capability and in the abilities of these technologies to communicate in sound, pictures, symbols, graphics, video, numbers and script – and to do so on demand. These capabilities will continue to improve and the costs of the technology will continue to fall (Woods, 1996:1 and Shanmugavelan, 2000).

However, most of these projects where technologies are introduced, are small, isolated and independent. Very few have spread widely. Even fewer have established a basis for the sustainable funding of the technology on a large scale. These projects also show that the full potential of the technologies lies in combining their separate capabilities into 'integrated

systems' (Woods, 1996:3). An advance in approach to funding the technology can make it accessible and affordable for everyone (Woods, 1996:2).

2.2.2 Introducing communication tools: Internet, telematics and ICTs

- **Internet**

The Internet, as one of the functions of the computer, forms part of the telematics, described in the next section. It is a medium of communication, and is perhaps the most flexible medium currently available (van Lill, 2000). As such, it has the potential to be integrated within a wide variety of projects that have objectives such as local participation, training, education, research (especially participatory research), technical support and institutional strengthening. Whenever a project involves people who need to communicate and share information across social groupings, between and within organisations, and throughout production systems, there is a need to create flexible systems of communication and information sharing. Projects that might find a role for Internet applications could range from agricultural training to community forestry to veterinary medicine (FAO, 1990 and van Lill, 2000).

In many ways, the Internet is suited to deal with information in a development context as a development communication tool. Information on topics such as tele-medicine, tele-schooling, job hunting, buyer's guides as well as information on a variety of agricultural topics are provided by the Internet (van Lill, 2000). It can also cut across social and geographical distance and help people find new ways of facilitating the flow of information and knowledge. Within bureaucratic organisations it can facilitate new communication patterns and help enable activities that might not otherwise occur (van Lill, 2000). This factor makes it an especially attractive medium for Development Communication. The key to achieving results in new Internet and development projects is to begin with a grassroots, beneficiary-inclusive development communication approach during the planning process (van Lill, 2000).

The Internet is also relatively cheap, powerful, decentralised and potentially an ideal platform to build a flexible and powerful environment for sharing and learning. The Internet is the first communication tool that allows every user to be a sender, receiver, narrow caster and broadcaster in a global sphere (Richardson, 1996; Bie, 1996).

The Internet is a medium of communication - a means by which various Web sites can be visited and by means of which various organisations can be communicated with, as

well as with private people by means of e-mail. It is therefore perhaps the most flexible medium currently available. The Internet may help meet peoples' information and communication objectives, in order to attain their development goals and objectives, but it must be integrated within human contexts and seen as a communication process tool and not simply as a static information technology or uni-directional broadcast medium. According to Bie (1998), the Internet is already making spectacular advances in the developing countries of the world. Despite the mediocre quality of its public telecommunications networks, Africa is trying to break out of its scientific and commercial isolation, by making the most of new technology.

The Internet is also not a panacea for the removal of constraints to rural development, but it does bring new information resources and can open new communication channels for rural communities (Bie, 1996:1). It offers a means for bridging the gaps between development professionals and rural people through initiating interaction and dialogue, new alliances, interpersonal networks and cross-sectoral links between organisations. It can create mechanisms that enable the bottom-up articulation and sharing of local knowledge (Bie, 1996:2), as was envisaged during the pilot project.

- **Telematics**

Telematics is a term denoting the convergence of computing, telecommunications and information (such as databases, CD-roms and electronic mail, as described above) and is not always simple. According to Inyang (1996:1) several problems were encountered when establishing the superhighway in Jos, the capital of Plateau State in Nigeria. According to him, the main problem with an e-mail system is the unreliability of electricity and telephone lines, which were often out of order for days on end. Even when they're working, power surges and poor telephone connections can dash attempts at communicating through telematics.

In theory at least, this ongoing Information Technology Revolution by means of telematics has opened up uncommon opportunities to developing countries in terms of providing low cost access to information, and the amount of users increase day by day. The fastest-growing tool of communication ever, with the number of users expected to grow from 150 million today to more than 700 million in 2001 (Shanmugavelan, 2000). Given that the same trend in user patterns continues, more than two-thirds of these people will be from developed nations. This divide between the North and the South has once again confirmed that history has always widened the

gap between the haves and the have-nots (Shanmugavelan, 2000; Moyo, 1994 and Woods, 1996).

- **Distribution of ICTs**

ICT (Information and Communication Technologies) include the above-mentioned aspects – the Internet as a function of the computer, as well as telematics, which comprise computing, telecommunications and information. As we enter into the knowledge-based century, which will be dominated by ICT and Intellectual Property, the developing countries will suffer from unequal distribution of scientific knowledge and be deprived of every reasonable opportunity towards development. "Writing computer programmes and revealing genetic codes have replaced the search for gold, the conquest of land and the command of machinery as the path to economic power" (Shanmugavelan, 2000). While knowledge goes on-line, the Internet divides the educated from the illiterate; the rich from the poor; men from women; young from old; and urban from rural - the information rich from the information poor (Britz and Blignaut, 1999). Predictably, many fear that while ICT connects people who mostly belong to developed nations, it excludes the major population from the developing nations. "To put it in simpler terms, apartheid based on technology has come to exist" (Shanmugavelan, 2000).

- **ICTs, cyberspace and theories in creating an information rich society**

It is generally accepted that the emergence of ICTs is contributing to the creation of a new "information society". A UNESCO (1996) position paper states that for developing countries the question that should be afforded high priority is not whether they should participate in the Information Society, but rather how information technologies can effectively be applied to development (Conradie, 1998:97). People want to participate in their own development so that their information needs may be addressed – by means of oral communication, as the communities to be developed, are mostly illiterate:

"People refer to newer insights on the role and place of communication for development which favours two-way and horizontal communication and techniques to increase people's participation in development and to inform, motivate, and train the rural population, mainly at the grass-root level" (FAO, 1987:4). People need, and want to be informed, in order to be able to take part in their own development – to

become part of the Information Society (Lazerfeld *et al.*, 1944:151). Although researchers expected to find that the mass media had a great influence, they concluded that voting decisions were chiefly influenced by personal contacts and face-to-face persuasion.

Two elements are involved with ICT and development: the notion of a population divided into 'active' and 'passive' participants, or 'opinion leaders' and 'followers'; and the notion of a two-step flow of influence rather than a direct contact between 'stimulus' and 'respondent' (or the so-called bullet, hypodermic needle theory, or stimulus-response theory) (Rogers, 1986:52). But, as mentioned above, people want to participate in their development. Since, the role of 'personal influence' (Rogers, 1986:54) has acquired a high status in research on campaigns and diffusions. Rogers (1986:49) stressed the adoption and diffusion processes of cultural innovation. He distinguishes between five phases in the diffusion process: awareness, interest, evaluation trial and adoption - where 'personal sources' are most important at the evaluation stage in the adoption process.

The Global Knowledge for Development (GKD) model (Mukasa, 1998:24) entails that the diffusionist (stimulus-response) model must not be replaced but be redefined in both horizontal and vertical communication networking structure. People learn from each other and from experts as well as government officials. But such learning must take place in an environment of equitable, fair and just distribution of resources and services. The ICTs will also not replace the traditional means of communication and information flow, as most developing communities are oral societies where the value of interpersonal communication is still regarded as the most common use of communication (Mukasa, 1998:22). ICTs should be introduced in an interpersonal, oral and participant way, integrated with indigenous communication methods .

Opposed to the stimulus-response theory, the technologically approach, Mukasa (1998) sees technology as a value-free and politically neutral asset that can be used in every social and historical contest – he sees the technology as the prepotent factor in development: It sees technology as the driving force to development. "Any technology gradually creates a totally new human environment" (Servaes, 1995:45), or, in other words, the medium is the message (McLuhan, 1964:VIII).

'Cyberspace' as a whole can be seen as an ideal platform to build a flexible and powerful environment for sharing and learning at grassroots level (Mukasa, 1998:4;

and Anderson *et al,* 1999:3): Electronic mail is an uniquely discursive communication mechanism, which can break barriers of time and place (Woods, 1996:2). The World Wide Web is a powerful tool for collaboration and participation (Anderson *et al*, 1999:3). At the same time, interactive multimedia applications are redefining publishing and 'reading'. The cultural impact of ICTs has been demonstrated in business, education, public and private life (Woods, 1996). It was foreseen that by providing this cyberspace to the community, information could be obtained and various ways to communicate would be provided. Moreover, telecommunications may be considered as the "infrastructure of the infrastructure", as it provides tools for the development and efficient use of other parts of the infrastructure - it should be weighed against needs of investment in other parts of the infrastructure, such as roads, railways, water supply and electrification (Ernberg, 1999:3)

2.3 AFRICA ON-LINE?

In rural communities world wide, the lack of access to these technologies is usually a major problem – with South Africa being no exception. The problem becomes one of how to extend the 'Information Superhighway' so that it covers that 'last mile' to reach remote rural areas (Epstein and Bruce, 1995) in Africa. Information technology is with us and it is spreading fast and we should now give thought to how to ensure that this last mile of its tentacles will be of benefit to the most economically insecure. We need to harness the potential of the Information Superhighway so that its messages are in direct response to local geographical, cultural, socio-economic and linguistic needs.

2.3.1 Extending the Information Superhighway to Africa

Is it possible, though, to establish a telecommunication network in Africa? To some researchers such as Zongo (1996), a global society is already rapidly being established in Africa, especially looking at electronic communications through small local network's telematics. Ernberg (1999:12) pleads to plan for the global village now, and not just to talk about it. NGOs have taken a leading role in developing computer-assisted communication in a number of initiatives to improve African network connectivity (Mukasa, 1998:13): African Council on Communication Education (ACCE) is spearheading efforts to train the media personnel in a range of issues including Environmentally Sustainable Development (ESD), consumer education, and electronic communication. It is supported by the United States Educational Scientific and Cultural Organisation (UNESCO), the United Nations Environmental Program

(UNEP), the Friedrich Ebert Foundation (FES) and the International Development Research Centre (IDRC) (Mukasa, 1998:21). A global society is "emerging with pervasive information capabilities that makes it substantially different from an industrial society: much more competitive, more democratic, less centralised, less stable, more able to address individual needs and friendlier to the environment" (Adam 1996:1; Mukasa, 1998:9 and Shanmugavelan, 2000). Adam then asks whether this is a "wish list" to a rural researcher in Africa.

This aspect seems, however, to have potential, as the importance of connecting the information poor to the Information Superhighway can not be stressed enough, and has been researched by the South African Government, as discussed previously.

Unless African countries become full actors in the global information revolution, the gap between the haves and have-nots will widen, opening the possibility of increased marginalization of the continent. On the other hand, participation in the information society offers tremendous opportunities for Africa to leapfrog over passed developmental deficiencies into the future. African scientists and researchers can participate fully in the global scientific community through direct access to the Internet, the global network of networks, by implementing these ICTs and informatics, which is the integrating of computer, satellites, VCR, telex and fax with the conventional telephone, television and radio (Mukasa, 1998:2 and Shanmugavelan, 2000). If this could be achieved throughout Africa, particularly in rural areas, people will have dramatically increased access communications and information, accelerating and bolstering sustainable development (FAO, 1987:2).

Problems with the establishment of telematics

The lack of adequate infrastructure is the key problem in establishing telematics in Africa. Nigeria's phone lines can go off for days or weeks on end, and it takes persistence and follow up by repair technicians of NITEL, the national Phone Company, to get the lines fixed. Power supply is also a problem – too little and too much. "We lost a modem during one power outage, which was followed by a power surge: the next morning, we found the modem all burnt up and melted. Luckily, there was no combustible material nearby so the fire didn't spread" (Inyang, 1996:2). The lack of information also acts as a barrier to development – information provision is seen as a formidable factor in determining whether developmental efforts in Africa are successful or not (Leach, 1999).

Another problem is the costs of production, transport and storage of books and periodicals: It costs too much to be affordable to African libraries - all but done in by years of structural adjustment programmes and, as for individual communications, rural researchers can not depend on deteriorating postal services, as telephone calls are too expensive and the phone systems too unreliable (Adam, 1996:1). He continues by saying that for the moment most Africans wanting access to e-mail or larger Internet services are dependent on the telephonic intervention of third parties, usually in the United States.

Telematics as a solution

African researchers should look at telematics - to replace the printed word with databases, CD-ROMs and electronic mail. To connect to electronic communication networks, rural researchers need networking tools (software, hardware, etc). African decision-makers, researchers and field workers also need the resources to maintain electronic information systems. Sustainability is the key concern, as, sooner or later, local resources will have to replace short-term external funding and technical expertise (Adam, 1996:1).

Over the last few years, low-cost store-and-forward electronic communications links to African countries have been established through small local networks in order to help redefine the educational environment and serve as a bridge to the future (Conradie, 1998:107). The World Bank lent US$124 million to Africa for informatics. Governments, donors, NGOs, among others, have invested significantly in the new technology of information and communication (Mukasa, 1998:13). Regional African Satellite Communication Project's (RASCOM) objective is to provide an efficient, reliable and economic means of telecommunications ... to all areas using a regional African satellite system, complemented as necessary by any other appropriate technology that is properly integrated into the existing national networks with a view of fostering the development of African countries (Mukasa, 1998:8). African network users are now lobbying their governments to improve and augment telecommunications infrastructure, particularly to spend money necessary to buy each country a "leased line connection" (Adam, 1996:1). These lines eliminate the need for that third party middleman (or his pre-programmed computer) and allow direct and almost instantaneous links to the Internet (Adam, 1996:1). This is because satellite communications overcome distances ... and low-cost earth stations requiring

relatively little maintenance and technical skills can be installed in remote rural areas (Mukasa, 1998:7).

2.3.2 Advantages of ICT for Africa

It is difficult to introduce and maintain electronic networks in Africa, but it is not impossible. Some of the world's poorest countries, such as Mozambique, Ethiopia and Angola, have already made substantial progress (Mukasa, 1998). Barriers, such as scarcity of primary power and qualified personnel, obstacles to constructing conventional transmission systems and economic constraints to operating these high-tech systems in unprovitable rural areas, can be minimised or overcome, and satellite communications can bring a host of info and knowledge to remote areas (Mukasa, 1998:7).

The cost of equipment necessary for connecting to a national e-mail central (called a 'node') is not so high; a phone line is the only additional resource needed. Using such equipment, an irrigation expert 700 kilometers from his capital can connect to a node each day to contact his colleagues worldwide, to send greetings to his family in the capital city, to develop joint proposals with an international NGO office in the United Kingdom and Uganda, to follow up on the procurement of lab equipment from Germany and to access data bases on the Internet (Adam, 1996:2).

An African forestry researcher in Pont Noire (Congo) can work on a collaborative research with others in the Amazon. Improvement in the quality of research and education in agriculture can be achieved by linking agricultural colleges to the Internet. African researchers can participate both in use and in the generation of knowledge on the network (Adam, 1996:2).

Speed, convenience and low-cost communications are some advantages of electronic communications. A letter sent from Morocco takes weeks to reach Ethiopia. An e-mail message takes less than a day to arrive. Transmission via e-mail costs the minimum a page; a faxed report can cost the whole monthly salary of a researcher. The same report can be transmitted via electronic mail for a fraction of a dollar. The ability to broadcast one message to multiple users facilitates more cost savings and on-line discussions. In fact, some "developing" countries, particularly in Asia-Pacific and in Latin America, are catching up quickly with the so-called "developed" countries (Ernberg, 1999:1).

Digital information about developing countries, but which resides in developed countries, can 'come home' through telematics: through the Internet an African biodiversity researcher can access research undertaken by foreign consultants working in their own country (Ernberg, 1999).

In conclusion, it should be said that it is of cardinal importance to bring ICT to Africa - in order to connect Africa to the Information Superhighway, because failure to bring these telematics to Africa will leave the continent farther behind than ever. This is explained in a communique issued during the Symposium on Telematics for Development in Africa, held in Addis Ababa in April 1995 (Adam, 1996:2):

Unless African countries became full actors in the global information revolution, the gap between the haves and have-nots will widen, opening the possibility to increased marginalisation of the continent. The gap will increase the likelihood of cultural, religious and tribal ghettos, leading to regional and interregional conflicts.

In order to reduce the rapidly increasing gap between the information "haves" and "have-nots", a massive effort must be made to develop the poor countries' capacity to use these new tools so that they can benefit from, and contribute to, the global information resources currently being developed at a mind-boggling pace - which are available through global, user-driven networks such as the Internet and the World Wide Web (Ernberg, 1999:12).

It should also be borne in mind that connectivity should be related to African social, economic and cultural needs. The ability to build self-perpetuating local networks, reaching not only the privileged few in cities but also rural researchers, is very important. The diversity of Africa requires specific national capacity building. Regional co-operation is important. Sub-regional collaboration is also useful to bring resources together and to share links (Adam, 1996:4).

2.3.3 Advantages of linking the agricultural sector in Africa by means of ICT

Despite the fact that information is seen as a critical resource for people and communities in both rural and urban areas, the lack of information provision in the agricultural sector remains a problem. Referring to Africa, Moyo (1994:62) points to the alarming information gap that exists between rural and urban areas and how little is being done to bridge this gap. In the South African context, Wakelin and Simelane (1995:72) point out that "whilst information is becoming increasingly available to

urban-based organisations through the media, modem linkups, workshops and literature, the historical marginalisation of rural-based people continues." This view is supported by Tomaselli (1995), who outlines the urban dominance of the media in South Africa and contends that the disparities between the developed and under-developed sectors of our economy will remain and might even widen.

To a large degree, South Africa still shares the networking problems of developing countries. According to Malan (1999:1), it should also be pointed out that the beneficiaries of information systems are almost exclusively restricted to urban settings in southern Africa. Most of the people in the largely impoverished and underdeveloped rural areas live in "another world". He continues that the media in general has little influence on their lives, let alone the Internet. But what then is the situation concerning agricultural information to be disseminated to farmers?

According to a survey done by Leach (1999), one of the NGOs involved in the provision of agricultural information mentioned farmer to farmer extension (that is using farmers to talk to farmers) as being:

Very effective because they themselves are the ones who interact ... they believe in themselves and the information is grasped so quickly, the diffusion of that information is so easily spread and, as you know, there is sometimes the problem of information not going through because of some structures, problems, all those things... (Leach, 1999:76).

Referring to rural African communities in general, Rosenberg (1993:34) mentions, among other issues, the lack of evidence on "the most effective information transfer methods." Examining East and Central African countries, he comments on how little research has been done on how best to provide the information that is required. Leach (1999:72), referring to information emerging from non-governmental organisation (NGO) circles, also points to "inaccessible presentation formats" and cites this factor as one of the reasons for information not reaching the agricultural sector for whom it should be intended.

It therefore seems important to get the farmers involved in agricultural activities in a dominating oral culture like Africa's together, to communicate by means of workshops and demonstrations so that the farmers as a group can receive the new information in a

group situation. When they are exposed to new information as a group, they can discuss the newly introduced topics and information among themselves.

The role of technology in achieving these social-development goals was placed on the international development agenda by Woods (1996:1):

> "(I) recognise that the new information technologies and new approaches to access to, and the use of technologies by people living in poverty can help in fulfilling social development goals and therefore recognise the need to facilitate access to such technologies".

What will this then mean in practice? Currently, about two percent of all people, schools, clinics, small businesses and communities in the world have access to computer-based technologies and to Internet and Information Superhighways (Adam, 1996:2). Numerous new documents on Information Superhighways define their capabilities in relation to national and global needs and focus on how the technology can be made affordable and/or accessible for the agricultural sector on a large scale. This is not achievable within current traditions.

The answer is to link the communities in the agricultural sector to the Information Superhighway. Paying for a direct link to the Internet can aid these communities in utilizing these meager resources more effectively. For example, communications between agricultural researchers and extensionists will encourage dissemination of new approaches ultimately leading to better maize harvests. Fast Internet communications will improve response to emergencies like drought, locust infestation, epidemic, etc. (Adam, 1996:1).

So far, however, these technologies have not reached the agricultural sector, and the Information Superhighways are separating the 'haves' further from the 'have-nots' and until now, there has been no alternative (Woods 1996:1).

Incorporating culture in development

If taken into account that culture is deeply woven into the lives of the agricultural communities, special reference should be made to culture in the development of these agricultural communities.

There are three assumptions why indigenous culture is the fabric within which development can best be woven:

- Indigenous elements have traditional legitimacy for participants in development programmes;
- these elements contain symbols that express and identify various valid perceptions of reality; and
- they serve multiple functions.

The following social/cultural forms discussed – along with traditional leadership, socio-economic processes, organisational forms, etc. - have clear implications for DSC (Coletta, 1980:17-40):

> Traditional communication systems (social exchange, assemblies, etc.) often leave observers amazed at the effective and speedy way that notices of meetings, etc., are conveyed by word of mouth in South African townships and rural communities; indigenous knowledge systems (farming practices, health promotion, etc.); traditional belief systems (especially cause-effect relationships, religious symbols, etc.): It could for instance have grave consequences for land development if community bonds with burial sites and the ancestors are not taken into account. Indigenous technologies and transfer (using local materials and resources, and the transfer of skills to use them) should always be borne in mind when developing a specific community.

2.4 ICT IN AGRICULTURE IN SOUTH AFRICA

Today only a minimum of developing communities are linked to the Information Superhighway. Access to telecommunication networks is therefore becoming a high priority in developing countries such as South Africa, especially in remote areas, where the majority of the population lives and is regarded as an excellent way of bringing telecommunication to these areas.

2.4.1 Rural development

> In South Africa, political decision-makers tend to confirm the fact that Information Technology (IT) can be effectively applied for development, e.g. the White Papers on Science and Technology and Telecommunication Policy (Conradie, 1998). Conradie mentions that, according to the White Paper, many political decision-makers have argued that there should be developmental initiatives in rural areas that help to provide public access to ICTs in specially equipped community centres, often referred to as telecentres (1998:98).

In rural areas, communication for development efforts, the communication staff, resources and equipment required to produce the required results and impact should be provided. The extent to which rural societies, in comparison to their urban counterparts, are under-resourced in the areas of electrification, has also illustrated this statistically. A similar imbalance exists in the areas of unemployment and the field of income and education (Leach, 1999).

A holistic approach to rural development should be used, which covers the multi-faceted aspects of life in rural areas and deals, not only with agriculture, but also with health, habitat, nutrition, population and women's issues. Partnerships should be sought with all the stakeholders in the development process. Use should be made of all available media infrastructure and channels, both modern and traditional, in an orchestrated fashion. To be sustainable and not create dependence upon technologies available only in industrialised countries, the communication media suited to the cultural, social and economic conditions of rural areas in developing countries should be used. They should be participatory and interactive (Balit, 1996:2).

2.4.2 Advantages of ICT in agriculture in South Africa

The advantages of ICT in agriculture in South Africa are many. Today there are many Web sites of agricultural-based companies (such as Naspers, the Agricultural Research Council (ARC), the South African Futures Exchange (SAFEX) for market and other financial information, the South African Agricultural Union (SAAU) and Agrimark, to name but a few). From these Web sites, agricultural information can be obtained for any rural community to become self-sustainable, or any commercial farmer to expand his farming activities. Information to be obtained from various agricultural-based organisations will be discussed in the chapter on the demonstration held for the pilot project at Thabina.

It is, however, not so easy for the ICT to reach the rural community and therefore efforts should be made by researchers to link these communities to the Information Superhighway. This can be done by implementing ICT, the key to expanding information to rural villages, by means of establishing a telecentre, a phone shop, etc. This is apparent from the Minister of Agriculture and Land Affairs, Thoko Didiza,'s recent budget speech (2000).

She said, "The challenge for the Government in terms of developing South African agriculture remains the need to deracialise the sector, promote and support economic growth and ensure that in the pursuit of these policies a better life for the people and continuous nurturing of natural resources are attained". It is hereby evident that the South African Government is making efforts to incorporate the agricultural sector in the dissemination of information. This sector is the sector most in need of ICTs, in order for the rural agricultural communities to develop towards self-sustainability.

One of the key initiatives was to broaden access to agricultural services, particularly for those who were without it before. As an outcome of that process, South Africa has identified the constraints faced by previously disadvantaged farmers, prioritised their concerns and developed new instruments for information dissemination among farmers. This could only be done by implementing ICT. All participants in the agricultural sector are involved - irrespective of gender and age: South Africa now no longer finds it rare to find black people, young people and women playing an active role in the agricultural economy.

One of the realities of South Africa is that most black farmers, small or other, have limited access to land and capital – let alone ICT - and have received inadequate or inappropriate research, extension and marketing support. This has limited their ability to grow and has resulted in an undue reliance to a greater or lesser extent on subsistance production. The Government has resolved to deal with all farmers. Recognising that they operate on farms of different sizes (Didiza, 2000).

What remains, is to finalise the characterisation of small-, medium- and large-scale farms, using their capacity to generate income, which could be assisted by obtaining applicable information by means of ICT.

South Africa should continue to engage the World Trade Organisation (WTO) and European Union (EU) and other trading partners to promote the ountry's trade interest. Ms. Didiza (2000) said that South Africa will commence with efforts to increase the economic integration of the southern African region. To be successful in this, South Africa needs to ensure that its resources are allocated, to ensure that there is capacity for the promotion of domestic markets, management of agricultural statistics, the development of defensive trade measures and the promotion of international markets through ICT. She also pointed out that none of the noble ideals could be realised if

farmers do not have access to the appropriate information services - such as the implementation of IT.

The content of information remains a long-term challenge. The Department of Agriculture is in the process of setting up an early-warning and information system for food security and natural disasters as part of a national information system.

During the next five years, a farmer-settlement programme that will specifically target young people and women as beneficiaries will be implemented (Didiza, 2000). The planning and implementation of the resettlement programme will be brought within the restitution redistribution process in the Department of Land Affairs. It will also be ensured that they are synchronised with the services and support programmes provided by the Provincial Departments of Agriculture, Land Bank, National Marketing Council and the Agricultural Research Council (Didiza, 2000).

2.5 TELECENTRES BRIDGING THE GAP

The use of telecentres for development has been discussed by various authors and is used in a variety of countries, mainly in Africa and Asia (Snyman & Snyman, 2000). Ernberg (1999) describes how rural community centres can empower communities in the information society and he shows how access to such technology could be vital to the economic development of disadvantaged communities. Defining information resource centres is problematic, Roman (2000) counted more than 30 names for such centres.

2.5.1 Preconditions and prefeasibility considerations of telecentres

It has been established by several researchers, such as Roman (2000); Benjamin *et al* (2000:8-16) and Anderson *et al* (1999:2) that there are several considerations to be taken into account with the establishment of a telecentre:

- When selecting locations for telecentres, consideration should be given to the level of potential demand for communication and information services from a large number and a wide range of users. This will ensure utilisation of the facility and reduce the expense to individuals through cost sharing.
- The proximity of the telecentre to other organisations and institutions that can play roles in using, supporting, maintaining or operating the telecentre should be investigated. Such organisations might include: hospital health centres, schools/colleges/universities, community and cultural centres, religious centres,

libraries, organisations of farmers/fishermen/craftsmen, post offices, local/national government administration offices, radio and television stations, NGOs and community-based organisations, among others, (Anderson *et al.* 1999; Shanmugavelan, 2000 and Ernberg, 1999).

- Considerations should include a location that is easily accessible to potential users (i.e. near public transport or within walking distance); the availability of an existing structure (e.g., school building, library, extension office) or a new structure which is suited to use as a telecentre (appropriate lay-out, secure); access to electricity; and connection to telephone lines and the Internet (terrestrial or satellite link). In some situations the development of telecentres may be inappropriate and other types of communication solutions, electronic or otherwise, should be explored.

- Socio-cultural aspects that may affect the utilisation of the telecentre, or which groups within the community have access to the telecentre, should be investigated. To be effective, telecentres need to be integrated into communities so that they lessen instead of widen the communication gaps between the information rich and the information poor.

- As in the case of other communication media, the advocates of Internet and other ICTs for development need to look beyond the technologies "to the social and economic systems in which the media functions and how these systems influence media access, exposure and impact" (Crowder, 1991). What is most important to do in this context, is to pay attention to the communication gaps, based on gender, that often exist, and incorporate into telecentre organisation the differential communication patterns that exist between men and women.

2.5.2 Telecentres - a solution?

The concept (of a telecentre) has already been successfully tried out in rural and isolated areas in many developed countries, e.g., in Scandinavia, the UK, including northern Scotland, Ireland, Australia, Canada, Japan and the USA. The 'telecottage' movement is steadily gaining momentum and national associations of such community telecentres, established in the developing word, could connect people with similar problems and experience of various aspects of community development (Ernberg 1999:10).

Telecentres are based on ICTs. The first ones were built in Denmark and Sweden in 1983-85. The idea has been taken up quite widely in Europe, notably in the United Kingdom (UK), where at the last count there were some 200 telecottages. More recently they have been established in developing countries, and according to Zongo (1996), 9 000 have been counted in Senegal, West Africa. Such facilities are called a number of names, including 'virtual village halls', 'tele-learning centres', and 'tele-cottages' (Anderson *et al.*, 1999 and Conradie, 1998).

Telecentres may employ various types of ICTs and offer services such as access to telephones and fax machines, photocopiers, printing equipment, e-mail, the Internet and electronic networking. Telecentres are also a venue in which new ICTs, such as the Internet, can interface with conventional ICTs (print, radio and video)(Conradie, 1998:98).

The idea of introducing computers and advanced telecommunication services to rural communities where people live the way their ancestors have for generations and are lacking even basic education, may appear inappropriate and too sophisticated, (Ernberg 1999:8). However, if rural areas should be able to compete in attractiveness for business, social and cultural activities with the large cities, rural communities must be provided with at least the same services at the same costs as those provided to the urban population. Arguably, rural communities need even better services to compensate for their geographical isolation and other 'penalties' of being far from the cities and markets (e.g. high transport costs).

The provision of access to ICTs by rural communities in developing countries is likely to go through telecentres. It should also be ensured that this development is as effective, efficient, sustainable and equitable as possible, so that the promise of the technology becomes a reality – a tool in the hand of the rural people.

The telecentre offers ICTs in order to link these communities to the Information Superhighway: Telecentres can empower people by giving them access to other information sources and new communication possibilities, enabling them to exchange expertise, increasing the level of computer and language skills for the current and future work force and enabling communities in rural areas to contribute to and share this knowledge.

The necessity of telecentres, and therefore of the applicable ICTs, are recognised world-wide. Today, the number of telecentres, some of them equipped with only a telephone and a fax machine and others with computers, printers and an Internet connection, is mushrooming all over Africa: "They are springing up everywhere," says Zongo (1996). "We have counted 9,000 of them just in Senegal, in West Africa, where they have opened job opportunities to some 20,000 people within the last five years".

2.5.3 Development possibilities created by telecentres in South Africa

Opportunities

The four case studies mentioned in this section all formed part of the 'Communication for Technological Advancement' (COMTECSA) research programme that the Human Sciences Research Council undertook in 1997 in collaboration with external research partners and organisations such as universities, technikons, and the Council for Scientific and Industrial Research (CSIR) (Conradie, 1998). The four centres studied are the SEIDET telecentre, the Hammanskraal Phone Shop, the Brits Publicity Association and the Micha-Kgase educational telecentre. An in-depth description of each centre can be seen in Appendix A. The main lesson learned from these sustainable initiatives, is the fact that a considerable level of pre-development activity was undertaken, which is why an in-depth preproduction audience research was undertaken during the pilot project - to ensure that the objectives of the pilot project, as described on page 55, could be met. It was proved that commercially-orientated centres with a market effect could succeed if there was strong leadership, of say, an intermediary. The importance of the participative role of the community in establishing these centres, was also very evident.

It is obvious that communities can be uplifted - socially and culturally, by means of applicable information. Without information, no community can be developed towards self-sustainability and it is therefore the core element in developing any community or society. Any community on the road to success should make it their business to determine how ICTs could be applied and the concept of the telecentre implemented to provide these developing communities with the applicable ICTs. This is described in the next section, as the telecentre might be the ultimate solution for bringing ICT to the agricultural sector.

2.5.4 The potential role of telecentres in the agricultural sector South Africa

No information on the guidelines to establish a telecentre centre in the agricultural sector, nor the potential of such a centre, is available in literature. Most telecentres described in literature are established in rural areas, including agricultural areas, which is not to say that these centres were established in the agricultural sector as such.

Telecentres in the agricultural sector have the dual role of:

- Supporting group and community development, as well as
- Supporting commercial development by drawing in more business capacity to support that community - especially by using technology in rural areas to generate additional employment and alternative income (Conway, 1995:99).

In the agricultural sector, telecentres can provide communities with agriculture-related information – information that can lead to the development of an agricultural community towards self-sustainability. The telecentre therefore opens the door to a community by means of providing the necessary tools to communicate, as well as with the necessary agriculture-related information.

One can imagine what such a telecentre could do for sustainable development in rural areas and for bringing people in remote areas in touch with the rest of the world: Telecentres could be used for data processing, for accessing databases (e.g., on market and price information) and for communicating with suppliers and customers (e.g., for marketing and negotiations of deals) by small local enterprises and individual entrepreneurs (Malan, 1999:7). If properly equipped, it could also be used for 'tele-training' (distance learning) and for 'tele-medicine (distance diagnoses and medical advice), so that the local people could learn new skills and get medical advice when needed. Telecentres are also likely to become centres for cultural and social activities, particularly if they are equipped to receive TV and sound broadcasting.

Availability of advanced telematics services in rural areas could not only contribute to reducing the urbanisation process, but may even reverse the trend by making it possible for enterprises to locate some of their business in otherwise isolated areas. The community telecentre could very well function as a remote office for 'tele-working', shared by several city-based companies. This could contribute to attracting skilled people (back) to the rural areas and to reducing transport of people. Such

educated and trained individuals are needed to sustain the process of development and change once the international and government support required to initiate community development is withdrawn (Ernberg, 1999:10).

The telecentre could, in geographically widespread and sparsely populated areas, be used as a local hub where public (and private) telephones located at strategic points covering the area is connected. It could also be complemented with paging systems so that villagers can be notified of incoming calls.

Applications that could be available in telecentres include 'generic' content developed outside the community. The most important applications, however, are likely to be those which are developed specifically for and by the local users. Many segments of the community should be included in the development of specialised applications, including youth and women. The 'generic' applications which are provided for use in telecentres should, where possible, include functions that allow local communities to contribute their own information to the pool of knowledge.

Telecentres are therefore important in the dissemination of information, and Sturges and Neill (1998:72) consider the "nature of the packages into which information is placed is crucial in provision of information to the whole community". Information should be compiled in a easy-to-understand package - preferably in the indigenous language, with pictures and sketches, as the rural people are mostly illiterate, and information should also be explained in an oral manner, as developing communities are mostly oral societies.

Telecentres are not just technology centres - they can also be living laboratories, which facilitate local sharing of information and ideas. A telecentre can take full advantage of global information, as well as facilitate the creation of a common local development vision (Anderson *et al*, 1999). Telecentres are not only a way to provide simple, single-point access to external information and services, but also a facility for local residents and groups to organise village meetings, video conferences and technology training to address their development needs, (Anderson *et al,* 1999:4).

2.5.5 Initiative investigated: Mamelodi Communication and Information Services (MACIS)

In order to obtain relevant information for the establishment of a telecentre, it was decided to investigate an existing telecentre - how it was run, funded, the limitations,

the training, the uses of the centre and the various technologies used. The Researcher decided to pay a visit to an established telecentre in order to obtain information on the potential role of a telecentre. The telecentre in Mamelodi near Pretoria, called MACIS, was visited and an interview was held with the manager, Esmé Modisane. The following aspects, which were discussed during the interview, could be established in the pilot project:

Aim of MACIS

The aim of the centre is to bridge the perception of inaccessibility that surrounds the term 'information', and to introduce information and communication technologies (ICTs) to the community of Mamelodi.

Location and operation

This is a community-based organisation (CBO), registered under Section 21 Company Act (Act No. 61 of 1973). Its mission is to provide information on all aspects of life to community members in order to cope with day to day problems and to improve their quality of life. The establishment of this telecentre originated from the CSIR, wishing to establish a Community Information Centre (CIC).

Funding of MACIS

This centre was funded by various organisations, as well as by the USA.

Uses of the centre at MACIS

On the uses of this particular centre the Manager commented that the centre was used for:

The compilation of CVs

Business plans for businesses

Internet and e-mail were used by the youth

The young also made use of the Info kiosk

The youth also used the centre for drafting assignments and

The computer was used for typing their 'own things'.

Limitations of MACIS

According to the manager of this centre, limitations include:

fear of technology experienced by the residents of Mamelodi. Presentations are therefore presented to the youth, the adults and the elderly in order to make them comfortable with the uses of the various technologies;

funding, where the unemployed can not pay for the services conducted by the telecentre. The manager herself was at that stage without salary for three months due to a lack of funding. She (the manager) suggested that funding organisations should be contacted for the establishment of a telecentre.

Training of the manager at MACIS

The success of a telecentre also depends on the manager of such a centre. To appoint just any person from a developing community as a manager does not guarantee that the venture will succeed. Such a manager should be devoted to the venture and should be trained according to his level of computer literacy. According to Roman's extensive, international survey (2000), it is worth noting that most of the panelists of his survey disagreed (50%) or strongly disagreed (12%) with the statement that telecentre managers were usually aware of their training needs. If telecentre managers were rarely aware of their training needs, this might mean that they are not aware of their role and the objectives of the telecentre they are called to manage. The role of a manager should therefore be explained to the manager in detail.

On training, she suggested that the manager of a telecentre should be trained in:

Finance, computer literacy, human resources (how to be sympathetic), communication, marketing, conflict management and, leadership skills.

On her own training, obtained from the USA, the Manager at MACIS commented that it was very good and lasted for two weeks. They also train people on Web sites.

This concurred with a survey done by Roman (2000) and the following skills of a telecentre manager were rated as follows:

Technical skills should include computer literacy: word processing, Internet and e-mail (very important); spreadsheets, Web site development and other software and development; other software applications and programs (important); equipment maintenance skills (very important); specific skills such as conflict management methods and techniques (important); monitoring and evaluation methods and

techniques (important); leadership styles and skills (important); and training methods, techniques, design, and organisation (very important).

For the pilot project, the skills in computer literacy, such as word processing, Internet and e-mail, as well as obtaining information from the various Web sites, are seen to be the most important and should be handled once the telecentre is implemented. At a later stage knowledge on equipment maintenance skills and on evaluation methods should be obtained. A short course in organisation and conflict management should be given as soon as possible – depending on the available funds.

Information and communication skills such as presentation skills were seen as very important; the design of a Public Relations plan as important; public speaking techniques and interpersonal communication skills as important; connecting with the unconnected as very important; basic practice of advertising and publicity as important; client identification and segmentation and needs assessment as very important; audiovisual production skills as important; writing skills as important; information seeking and research methods as important; and communication strategies for social change as very important.

CHAPTER III - PREPARATORY PHASE OF THE PILOT PROJECT AT THABINA

Synopsis

This chapter comprises the background information on the pilot project at Thabina. It starts with the origin of the pilot project, which includes how the pilot project was initiated, and answers to the question why this specific community was identified and why there was decided on the establishment of a telecentre. Justification of the project is explained and the profile of the community of Thabina, where the pilot project was executed, is given. The planning of the process, with an outline of the pilot project and specific reference to the aspect of the communication paradigm, as well as the communication methods used, follows. The chapter concludes with the discussion on how the objectives and the perspective could be reached.

3.1 PILOT PROJECT SUMMARY

3.1.1 The origin of the pilot project

As Media Liaison Officer of the Institute for Agricultural Engineering (ARC-ILI), an Institute of the Agricultural Research Council (ARC) in South Africa, the Researcher attended a meeting of the Development Committee of Thabina in February 2000. The Development Committee consisted of 15 elderly African male farmers and one African woman, appointed as extension officer by the Department of Agriculture, Land and Environment. This meeting, like the succeeding workshops, took place in an existing building where the Development Committee gather for their meetings. The communication took place in English.

The rural agricultural community at Thabina had recently established a new order at their irrigation scheme, a WUA, and the Researcher attended the meeting in order to obtain information for a press release on this topic. This press release was written on behalf of Loxton Venn Associates (LVA), consultants appointed by the Department of Agriculture, Land and Environment of the Northern Province (NPDALE) to rehabilitate the irrigation scheme and to establish a WUA.

During this meeting it became apparent to the researcher that this WUA would now need ways to communicate with the Department of Water Affairs (DWAF), the Water

Research Council (WRC), other WUA's and other agriculture-related organisations. They would also have to obtain information on various agriculture-related topics, identified by the researcher, which could be obtained from various ICTs such as the Internet, e-mail and various Web sites. During the tea break, a discussion with Dr Rutherfoord of LVA was held to explain the concept of a telecentre to him and it was decided that the Researcher would look into the possibility of establishing a telecentre at Thabina. After a workshop held with LVA and the Development Committee at Thabina (as described in the following chapter) in March 2000, it was decided that the information to be obtained from the ICTs should be explained to the Development Committee, in order to commence with the establishment of a telecentre as a pilot project.

3.1.2 Why the community of Thabina?

The "poorest of the poor" must be identified and their interest taken into account in project design (McNamara, 1998:33). The Department of Agriculture, Land and Environment had therefore identified this community of Thabina to be developed in order to become self-sustainable. After establishing the WUA, it was evident to the Development Committee that they would need systems to enable them to communicate with other WUA's, the DWAF and other agricultural organisations. According to an assessment of their needs, they would need information on agriculture-related issues such as farming mechanisation, pesticides, fungicides, how and when to irrigate, market and market trends and on how to correspond (write letters, receipts, etc.) with other agriculture-related organisations.

It was also envisaged to, eventually, understand all the links and sources of agricultural information and knowledge so that it could become possible to plan interventions that could improve the system of information exchange and thereby improve these farmers' agricultural knowledge and the value of their practices and knowledge – "an approach to map the communication networks which exist in an agricultural system and to identify the main factors which play a role in shaping agricultural and rural development" (Raminez, 1995:2). According to Wyley (1995:6), systems to communicate development information in rural areas of Africa have been "wasteful, inefficient and haphazard" and to avoid this, the oral communication system of the community was taken into consideration during the

preparatory phase of the pilot project, and participant communication was used during the workshops.

3.1.3 Why a telecentre?

The pilot project comprised guidelines for the establishment of a telecentre for the rural agricultural community at Thabina. By means of this telecentre, members of the community could be exposed to various fields of computer technologies and the information to be obtained from these technologies - in order to become self-sustainable.

Such an electronic network could be seen as a town square and library all in one: a repository of knowledge and an opportunity for interactive discussion. As opposed to libraries and the mass media, electronic networks engage millions of users in interactive learning in a 'virtual college'. The availability on the Internet of thousand of news groups on almost every topic, mailing lists, on-line data bases, files and on-line books create conditions under which an agricultural community in a remote region will have access to telephones and computer facilities, so that it can participate in knowledge generation and use.

The nature of the ICTs used in this centre could be an effective tool for development, and the success of telecentres in Europe suggests that telecentres may also be an effective mechanism for making the Internet and other ICTs available to rural communities. This explains the recent initiation of a number of telecentre pilot projects in developing countries (Anderson *et al*, 1999 and Conradie, 1998).

The term telecentre has been used to describe a broad range of services, including commercial call centres, satellite offices and facilities (e.g. fax, telephone, computing, Internet) use. For the pilot project, the concept telecentre meant the fusion of telecommunications, information, and multimedia and computing functions to help address a variety of community problems and needs (Fuchs, 1999). Services offered would range from basic e-mail to full Internet connectivity. Although books and periodicals would be available, this telecentre would not be a library. It was also envisaged that, eventually, the community of Thabina should take ownership of the telecentre, as people to be served by the project must accept it as their own.

Justification of the pilot project

Several aspects, according to Mody (1991) were taken into account in order to justify the pilot project:

According to Mody (1991), the recipients must express a need, which should be addressed. Absence or lack of a need is negative and harmful, as was the case with the community of Thabina – they could not develop towards selfsustainability due to the lack of applicable information. This deficiency was felt by the community and expressed by them. After the demonstration, the Development Committee agreed that they needed a telecentre by which means they could obtain various information and through which they could communicate with other organisations.

Alternatively, Mody (1991) explains, a need might be observed by a development planner as a discrepancy between the quality of life individuals should experience, and their present knowledge, attitudes, and behaviours. The pilot project was based on the latter alternative: a need was observed by a development planner, the Researcher. The content of the information presented to the Development Committee had advantages over the prevailing knowledge held by them. These advantages were economic (more money, land and food) and social (more power, community approval, status and influence). The content was also timely, as the Development Committee had recently established a WUA and would need more and more information regarding agricultural practices. The information was also applicable, as it contained information on markets and trends, crop cultivation, daily market prices and various other aspects necessary for the WUA to operate successfully. The information was also simple enough to be understood by the Development Committee as various print-outs – full colour pictures of the information to be obtained from the Internet - were distributed during the demonstration held.

Mody (1991) suggests that when elderly people are addressed, a serious form should be adopted. As the pilot project was aimed at the members of the Development Committee, it was decided to adopt a serious form, as prescribed by Mody (1991). They were all mature adults and most of them illiterate, which is why the translations by a local teacher were necessary.

Unobtrusive observation was followed by unobtrusive documentation of observations. All documentation was done by hand and by a small tape recorder hidden under the

table. As a variation on group discussions, this method of information collection is often called the group depth interview, or the focus group interview. Ideally, these group interviews were conducted in a quiet informal atmosphere, where a small group of farmers (the Development Committee) was interviewed. The meetings were also scheduled to take place at a time suitable for the committee members, on a day they could all be present due to a local meeting they had arranged beforehand.

3.1.4 Development of the Thabina community as such

Commercial success requires sound commercial planning, while community acceptance needs good community-oriented planning and involvement – commercial planning will not necessarily lead to successful community upliftment, while planning to better the community will not automatically result in financially viable activities. But communication based on the DSC paradigm, still forms the sound basis for any development project (Conradie, 1998:111).

The concept of the information to be disseminated must therefore be taken into account. The White Paper on Science and Technology (South Africa, 1996c:10) leaves little doubt about the importance of information and communication in the development process: "The ability to maximise the use of information is now considered to be the single most important factor in deciding the competitiveness of countries and their ability to empower their citizens through enhanced access to information".

This project involved the upgrading of the community's social and cultural activities for community development by means of introducing the technology and thereby exposing the community to applicable information for development. As mentioned, the community was developed by the value adding model of Boon (1992) (as discussed earlier) where data was converted into practical, applicable information that lead to knowledge, that lead to action – the implementation of the knowledge. This information played an important role in the decision making, creativity and innovation of the community – to be able to expose this community to development by means of tele-working, tele-training, public administration, remote access to health care (tele-medicine), etc. besides the traditional use of the telephone.

Both workshops, held during the preparatory phase (Chapter III) and the implementation (Chapter IV), were held in the existing building on the premises at

Thabina – a building familiar to the Development Committee, where they regularly hold their meetings. The communication flow was horizontal, as needs were discussed throughout the workshop and the various technologies were explained. Due to a lack of electricity, the demonstration of the technologies was done by means of a laptop. As this was an illiterate, oral society, various print-outs of information to be obtained from the technologies were explained and handed out.

3.2 PLANNING THE PROCESS

The pilot project was undertaken for the rural agricultural community at Thabina. As they are an oral community, the communication strategy to be used, was at first investigated by the Researcher.

Role-players were identified as the Development Committee, LVA as consultant on behalf of the NPDALE and the Researcher. These role-players were identified according to psychographics (fears, hopes, motivating factors), occupation (farmers, consultants and researcher), interest (all parties had development as an interest) and experience (illiterate farmers, consultants and researcher of DSC).

3.2.1 Outline of the pilot project

Research was done in a participant manner, based on the DSC paradigm, where a climate of mutual understanding was established by means of group discussions - a form of interaction with role-players and personal interviews with the members of the Development Committee.

During the workshops it was agreed that once the Development Committee agreed that a telecentre had to be stablished, the telecentre would be implemented in an existing building. This is a bricks and mortar building in which the Development Committee regularly have their meetings. Although not situated in the community itself, the building is situated at the edge of the irrigated land and also next to a small co-operative where the community buys farming and day-to-day requirements. Once supplied with electricity, it would be furnished with a computer (with a modem and Internet facilities), a photocopier, fax and telephone lines. Here the community would be able to obtain agriculture-related information and communicate with other agriculture related organisations. The telecentre would be implemented in various phases, as described in the next chapter. Briefly, it comprised the following steps,

executed by means of participant communication, where a free exchange of ideas took place:

First of all, the concept of a telecentre and where it would fit into the management of the WUA was explained to the Development Committee. An in-depth needs analysis was executed by the Researcher and a demonstration of the various technologies and the information to be obtained these technologies, were executed and evaluated. The needs analysis was executed in order to understand the needs of this community, and of the information needed by the community in order to comply with these needs, for them to become self-sustainable. The demonstration of the various technologies was executed in order for the Development Committee to realise what services such a telecentre could render them. The demonstration of the information to be obtained from the technologies was also done so that the Development Committee could identify the information they would need in order to become self-sustainable by means of the establishment of a telecentre for the agricultural society of Thabina.

3.2.2 Communication based on the DSC paradigm

For instance, one particular Phillipines project (Richardson, 1997), drew attention to the fact that for many rural people, interpersonal communication or peer communication is the primary means of communicating and exchanging knowledge (Richardson, 1997:6; Leach, 1999; Mukasa, 1998). Anderson *et al* (1993:3) proposes the creation of ways to combine this with electronic media processes, which should increase the effectiveness of both. Because the community of Thabina is an oral community, this project was based on interpersonal communication, where a local teacher translated the information into the indigenous language.

The execution of the pilot project was based on the pluralistic paradigm of Development Support Communication (DSC). This paradigm is seen by O'Sullivan *et al.* (1994:50) as a negotiation and exchange of meaning in which messages, people-in-cultures and 'reality' interact for meaning to be produced and understanding to occur. Throughout the pilot project, the negotiation and exchange of meaning by means of culturally determined interaction was of primary importance.

As a strategy, DSC can mobilise people for action, promote co-ordination and linkages among groups and stimulate awareness of, planning for, and participation in development. As a strategy for ICT applications, development communication

"(should) begin with the needs of people in rural communities and grassroots agricultural organisations and works to establish vertical and horizontal channels of communication" (Richardson, 1997). This is the reason why, first of all, a needs assessment of the community of Thabina and the analysis thereof were based on the DSC approach, which was applied according to the following aspects:

- Participatory problem analysis and development planning took place via dialogue and consultation. This ensured information flow among the role-players and promoted local information networks; it linked rural knowledge and information systems and helped integrate indigenous and scientific knowledge (such as the story-telling described later); and it empowered the local people to take control of their own development processes (Raminez, 1995:2).

- A good understanding of local communication patterns and processes of the community of Thabina was essential for the telecentre development to ensure appropriate applications of technologies and content to the local situation and for harmonisation and integration with existing communication channels and processes. This includes cultural and social norms, where and how people communicate, what is communicated, and by whom. This information was collected during the discussion of the current needs, with the Development Committee.

- "The choice of technology was to be 'appropriate', that is, affordable and environmentally sound" (Agunga, 1998:32). If we are to speak of effective information and communication and knowledge in support of development strategy, we must see the intended beneficiary in terms of a human agency, a rational and actively involved individual whose indigenous information and communication structures (community) will form the foundation for the cocktail strategy (Mukasa, 1998:4). The research of the pilot project was therefore executed by means of oral, interpersonal communication, in order to take the indigenous communication structures (oral communication) into account.

- One of the important barriers to information flow is linguistic (Boon, 1999). For the pilot project, a translator (local teacher) translated the English into the indigenous language. Centres without the services of trained DSC

professionals have little chance of being widely used and the researcher of the project was a student in Development Communication who, after the literature study, supported the idea of the DSC paradigm.

- The content might be right, but if the presentation is not appropriate, the communication process will not be successful (Leach, 1999:72). It was therefore decided that the basis of this project would be participation-as-an-end, which enhances peoples' ability to become active in development programmes and processes that they themselves articulate, plan and initiate (Melkote, 1991:262), based on interpersonal communication in this oral society. It was hoped that the oral approach in the group situation of the pilot project would build trust by means of personal contact. This would therefore ensure that the information to be communicated, could be trusted.

Based on knowledge obtained from the Internet and publications such as *Communicare*, the Researcher decided to executed pilot project by means of the DSC paradigm and that the research would be conducted orally, as Thabina is an oral society where most of the recipients (members of the Development Committee) are illiterate. Speakers involved in conversation had direct contact with the Development Committee. They could see/hear the reactions and resistances of those they were addressing and could adjust their words and gestures accordingly (Mody, 1991).

3.2.3 Communication methods used during the research process

Communication methods were chosen to fall within the DSC paradigm and research was done by means of participant observation during the workshops where the concept of the telecentre was explained, how this telecentre would fit into their management and also during the demonstration of the various technologies. Personal interviews with the members of the Development Committee to discuss their needs, fears and their expectations were also used as a research method.

The DSC paradigm is described by Brundtland (1989:14) as "meeting the needs and aspirations of the present generation without compromising the ability of future generations to meet their needs". According to Malan (1998:65), development is usually seen locally as the process of "enabling people to achieve their aspirations by improving their present situation". This implies that people are helped to help themselves through a process of change, which includes development of skills, self-

image and courage. Development also involves raising expectations to new levels and getting involved to reach those new expectations (ESKOM, 1995:6).

3.2.3.1 Verbal communication

In order to obtain information on the communication with people from a developing world, Mr Johann Adendorff (an expert in cross-cultural communication and a consultant of LVA) was contacted and two meetings were held with him in his office at Nylstroom. During these meetings with Mr Adendorff, it became clear that in the African culture, questionnaires appeared to be a threat. Africans are suspicious about giving personal information, because they think that, as in the old regime of which they still have a negative connotation, it would be used for taxation or other purposes. It was therefore decided that no questionnaires would be used, but that research for this project would focus on an oral, participatory approach in which communication would play a dominant role.

The purpose of these workshops was to explain the concept of a telecentre to the Development Committee and where the telecentre would fit into their management of the WUA, to discuss and analyse the various needs; and to demonstrate the various technologies and the information that can be obtained from these technologies. During the workshops, focus was on the communication process as a "facilitated intervention ... to catalyse two-way communication, dialogue and problem-solving" (Richardson, 1997:1). The workshops were an interplay between the role-players - the Development Committee, Dr Jon Rutherford, the facilitator on behalf of LVA and the Researcher.

Mody (1991) points out that understanding is based on interaction and discourse where all parties have equal opportunity to explain, interpret, and justify without fear, violence, or sanctions. It can not be repeated too often that an identity of meaning can not be achieved between a sender and a receiver unless both have a chance to participate in a dialogue as they construct meaning. The communication during the pilot project was spontaneous, with good interaction, according to the DSC paradigm

3.2.3.2 Non-verbal communication

Non-verbal communication comprises gestures, body language and facial expressions. It is also appropriate to dress and behave to fit in with the local scene (Mody, 1991). The researcher therefore decided to wear a white blouse and a long skirt during the various meetings with the Development Committee, as in the indigenous culture of the Thabina community, these codes indicated 'femininity and cleanliness'. White is also a colour which conveys the image of honesty, truthfulness and trustworthiness. These concepts were essential to portray, as the Researcher and the recipients did not know to each other and an atmosphere of trust had to be established.

The print-outs distributed during the demonstration was also a form of non-verbal communication. These print-outs were samples of information that could be obtained from the various Web sites, which were descriptive as it contained sketches and was in full colour. (For a detailed description of these print-outs, see the next chapter on the print-outs used during the demonstration of the information that could be obtained from the Internet).

Dr Jon Rutherfoord was appointed by the NPDALE as a consultant, in order to upgrade the irrigation scheme at Thabina. He is very well known to this community and had been working with them for many years. He is also trusted by the community and has acted as spokesman of the Development Committee during this period - including their application for a WUA from DWAF. As he knew this community of Thabina by heart, it was decided that all communication during the preparatory phase should be done through him. He also did an extensive survey of their needs (in collaboration with them), as described in 4.3 on page 72.

During the first interview with the facilitator, Dr J. Rutherfoord, as spokesman for the Development Committee, which took place during March 2000, these aspects were discussed. It was decided that the pilot project was important in terms of the fact that no research had ever been done to determine the specific information needs of a rural agricultural community was, in order to establish a telecentre with the necessary ICTs, to address the specific needs.

3.3 OBJECTIVES TO BE TESTED IN THE COMMUNITY

During the interview with the Facilitator, various objectives were agreed upon which were to be achieved in the long-term:

- Establishment of access to telecom infrastructures and community information and communication services.
- Evolution of user-defined services for education and other prioritised purposes, as well as guaranteed sustainability through a gradual implementation of a telecentre concept in a distinct number of phases.

3.3.1 Short-term objectives

For the short-term, two phases were decided on. During the **first phase**, efforts should be made:

- to obtain the consent of Mr Massoud Shaker, Director of the Policy and Planning Unit of the NPDALE, to execute the pilot project in his province, and to obtain the consent of the Development Committee for the establishment a telecentre at their WUA.
- to do a needs analysis and to hold a demonstration – according to the identified information needs - to introduce the various technologies and the information that could be obtained from these technologies to the members of the Development Committee.

Information needs in the community should be identified on a continuous basis, info should be collected/updated on a regular basis, appropriate information according to the needs of the community should be collected and stored and to raise funds for the execution of the objectives set out above.

During the **second phase** of the short-term objectives, the following aspects should be addressed:

- to identify information needs in the community on a continual basis,
- to provide the Development Committee with local, regional, national and international information as required, and
- to collect/update information on a continual basis. Once achieved, public telephone services should be rendered to community members and typing,

printing, photocopying, public telephones and fax facilities should be provided. Networking with other community resources through referrals should be established and the community should be linked to the world through the Internet by its own Web site.

3.3.2 Long-term perspective

The long-term perspective of the pilot project was also discusssed during this meeting. It was decided by the Researcher and Dr Rutherfoord that a telecentre, which will contribute to sound access to communication and information infrastructures, should be established once the consent of the Development Committee was obtained. This telecentre should be used in such a manner that it would contribute to, e.g. good governance and local livelihood opportunities. The telecentre should be equipped to the extent where it would make more information and communication possibilities available to more people. This would enable, *inter alia,* the farmers and producers to access market information, as well as to participate in relevant decision making processes. The level of computer and other skills for the future work force should be increased and electronic resources could, for e.g. be shared by rural schools. The community should also be enabled to form virtual groups/communities of interest.

3.3.3 How these objectives and the perspective could be reached

Although the emphasis in developed countries has been on the personal computer and personal access to the Internet, this situation is not feasible in rural areas of the developing world at present (Anderson *et al,* 1999:3). The link between ICTs and the local people would most likely have to be made through existing communication channels, such as the consultants and the rural teacher (who did the translation during the pilot project) (Anderson *et al,* 1999:4). Attention to creating and sustaining these linkages was crucial to ensure that ICTs reached their potential as tools for development. In this regard, it was important to direct attention to how the telecentre infrastructure and technology could best be configured or organised to facilitate group use. For the pilot project, the local schoolteacher translated the information provided by the Researcher, both during the preparatory phase and the implementation of the project planning, into the indigenous language (Sjangaan) so as to be understood by

the Development Committee. This was successful, as the teacher not only translated the messages very well, but also because he was well-known to and trusted by the community, as he taught at the local school.

Apart from the linkages between the technology and people, there are potentially new interfaces between electronic and non-electronic media processes. Creative ways of combining these two media will help to increase the effectiveness of both (Anderson *et al*, 1999:4). The creative ways used in the pilot project were to have a practical, detailed demonstration and to circulate print-outs of the variety of information obtained from various Web sites. These were simple sketches in full colour to increase the level of interest, and most of them were very descriptive so as to be easily understood by the Development Committee.

However, ICTs are new to many people in rural areas. To assist these rural people to identify what technological applications, services and content they may need or want, they would have to be made familiar with the uses of these technologies and the potential applications and content appropriate for their situations (Anderson *et al*, 1999 and Ernberg, 1999). Familiarity with the technologies would enable these end-users to have a productive dialogue with the designers and suppliers of the applications and to adapt and create their own content. Ways to accomplish this are study tours, that would take rural people to where the technologies already exist, and/or organising demonstrations of, and training in the technologies (Anderson *et al*, 1999:3 and Leach, 1999:77 – 80). The pilot project comprised the latter, where an extensive demonstration of the new various technologies were introduced, as described in the following chapter.

One of the greatest risks in telecentre development is that the technology will remain 'alien' to the local community and they will feel little involvement or ownership of the telecentre. This of course limits the effectiveness and sustainability of the initiative. This was addressed by engaging the local community in all stages of the development project and by capacity building that could develop the skills of local people to take responsibility for the organisation, maintenance and operation of the telecentre.

CHAPTER IV - IMPLEMENTATION OF PLANNED PROJECT

Synopsis

This chapter comprises a description of the actual implementation of the planned pilot project, as described in the previous chapter. Firstly the consecutive phases during which the pilot project was executed, are stated. The execution of each phase is then described: After approval to execute the pilot project was obtained, a background study on telecentres, where interviews on cultural aspects were held with Mr Johann Adendorff, was completed. The most applicable communication techniques were then identified, since the information needs of the community formed the basis of the pilot project. This was followed by a preproduction audience research, where the Development Committee was introduced to the meaning of a telecentre and what it may offer their community by addressing their information needs. A needs analysis was executed by the Researcher afterwards. To integrate indigenous culture, development and the management of the WUA, it was necessary to use an ordinary day-to-day example to explain where the telecentre would fit into the management of the WUA. This explanation was done by means of the illustration of a wagon stuck in the mud, and how the telecentre, as one of the oxen, could contribute to leading the community to development. This was followed by a comprehensive demonstration of the various technologies and the information to be obtained from these technologies.

4.1 PHASES OF THE PILOT PROJECT

The researcher determined that the pilot project should be executed according to the following phases:

- Obtaining approval to execute the pilot project at Thabina
- Background study
- Getting to know the audience
- Identification of information needs
- Integrating indigenous culture, development and management
- Demonstration of the various technologies and the information to be obtained from these technologies.

- Evaluation of the pilot project (Chapter V).

4.1.1 Obtaining approval to execute the pilot project

Before the pilot project could commence, it was necessary to obtain the approval of Mr Massoud Shaker, Director of the Policy and Planning Unit of NPDALE for the pilot project to be executed in his province. He allocated several irrigation schemes in his province to be rehabilitated in order for the community to become self-sustainable and Thabina was one of these irrigation schemes. He appointed LVA as consultants, to uplift the irrigation scheme at Thabina. A letter explaining the extent of the pilot project, the aims and the objectives, was compiled and mailed to Mr Shaker. Mr Shaker was impressed with the idea, but as an agriculturist, had no knowledge of the subject. Meetings with Mr Shaker were arranged in order to explain to him the concept of a telecentre:

- The term telecentre was introduced during the first meeting with Mr Shaker. For the pilot project, the term telecentre would comprise access for the members of the Development Committee to various technologies such as the fax machine, photocopier, a computer with a modem and access to the Internet. It was explained that by means of the technology, the community of Thabina would be uplifted socially and economically in order to become self-sustainable. Through the technology mentioned, they could obtain information on all aspects of agriculture, such as the various aspects of irrigation and irrigation schemes, fresh produce prices, market prices and trends, mechanisation, soil conservation, etc.

- The community members could also communicate by means of e-mail and fax, as a recently founded WUA, with other WUA's, and other agricultural related organisations such as the WRC and DWAF.

- During the second meeting, Mr Shaker was also introduced to the telecentre MACIS, that was previously discussed, in Mamelodi near Pretoria.. He was greatly impressed and agreed that this was the kind of progress Thabina needed, i.e. to solve internal problems by implementing various technologies: "... The belief that underdevelopment is rooted in mainly internal causes which can be solved by external (technological) aid – are still shared by many

development agencies and governments" (Servaes J, 1995:47). His letter of consent was received soon afterwards and the pilot project could commence.

It was agreed during this meeting that the telecentre would be established at Thabina once the consent of the Development Committee Members had been obtained. Mr Shaker mentioned that his Department would appoint a manager. During the pilot project it seemed that writing skills and information-seeking skills were the most important for a Manager, because the Manager would have to correspond with other WUA's and with other agriculture-related organisations. The importance of interpersonal communication skills should not be underestimated. As with the technical skills, obtaining such skills would depend heavily on the availability of funds for courses in these skills.

Technologies at the centre included a fax-photocopier-scanner in one, various computers, as well as the info kiosk. Such technologies can be used on a daily basis, which will foreseeably be the practice at Thabina at a later stage. Firstly, the technologies should be used to correspond with other agriculture-related organisations by means of the Internet and e-mail and also to obtain agriculture-related information from the various Web sites.

It was agreed that communication and further arrangements and settlements would be communicated through the consultant, Dr Jon Rutherfoord of LVA, who was to be the facilitator for the pilot project.

4.1.2 Background study

Apart from the literature study as described in Chapter 2, a background study was then undertaken by the Researcher and various interviews took place to gain information on the following aspects:

- **Communication**

  Various interviews were held with Mr Johann Adendorff of LVA, and throughout the meetings he stressed that communication should take place in a very simple manner so that the illiterates would be able to understand what was being said and meant. It was decided that the demonstration of the technologies, as well as the print-outs of the information obtained from these technologies would be as untechnical as possible, in order to be understood by the illiterate people.

- **Culture**

  Mr Adendorff also stressed that examples from the indigenous culture should be used in order to integrate new knowledge into the everyday lives of the Development Committee. As one of the consultants of LVA, he was well-known and trusted by the Development Committee at Thabina. To integrate the indigenous culture he was called upon to assist with the demonstration of the integration of the technologies of a telecentre into the everyday lives of this community by means of story-telling.

- **South African telecentres**

  As described earlier, an interview with the manager of the MACIS initiative was held. Valuable information on the establishment, funding, aim, limitations and uses of such a telecentre was obtained. It was decided that the telecentre at Thabina would first of all be used for obtaining agriculture-related information and to communicate with other agriculture-related organisations. Later on it could also be used to compile CVs and business plans, as was done at MACIS telecentre in Mamelodi.

  The fear of technology, as experienced by the users of the technologies at MACIS, could also be a problem, but after the demonstration of the uses of the technologies, it was envisaged that this could be overcome. Funding, as experienced by MACIS, would also be a problem. Application for funding should be made to the NDA and other donor organisations to be identified. As with MACIS, the Manager should be well trained in the uses of the technologies.

4.2 GETTING TO KNOW THE AUDIENCE

As it is also far easier to train people to develop skills in areas relating to information and network technologies than it is to take the shy, reticent and socially reluctant person and turn him/her into an extrovert and community animator (Fuchs, 1999), it was decided to communicate through the Development Committee, rather than to address the whole community.

The first workshop was used as an aid to planning - to help decide what to communicate in the broad general area like agriculture through the assessment of the information contexts and information needs of the Development Committee. This stage of formative evaluation is

called context evaluation by some, needs assessment by others, and diagnostic research or front-end research by still others.

Ernberg (1999:12) argues that many people doubt whether typical villagers such as illiterate farmers … would be able to learn to use sophisticated IT and telematic tools. He continues to explain that experience indicates that even uneducated persons can learn how to use modern tools if they could only see the benefit of such tools and if they are motivated.

It is therefore necessary to encourage people to become involved in "information seeking behavior" (Fuchs, 1999). Simply put, people need to come to learn that it is worth their while to take the time and trouble to find information to help them solve their problems. It was therefore necessary to spend some time on helping the Development Committee to understand the value of information and the tools that could be used to access it.

Listening to what the others say, respecting their attitude, and having mutual trust were the basic elements of this process. But it was also borne in mind that the people who were to be developed by means of the technology had their own experienced ways of communicating: "The(se) people are intelligent and have centuries of experience – draw on their strength and listen to them" (Xavier Institute, 1980:11) – listen to what they need, especially their information needs. It means facilitating communities to define their needs in terms of communication (who wants to communicate with whom, why, how), information (what information is needed, by whom, when, where, for what purpose, etc.); and education and training (who needs what, when, where and how would they prefer to have it delivered to them (Richardson & Paisley, 1999:1). Balit (1996) also argues that the development process should start with an assessment of the local knowledge and information needs of farmers. The (easier) way of communicating by means of the technology (e-mail, and fax) – would therefore be explained to the Development Committee.

According to Boon (1992:64), the quality of information should be high. This has to do with the reliability of the information and the system that provides the information. In terms of the information held, it should be accurate, comprehensive, current, reliable, and valid. As Thabina is a farming community, all information and communication would first of all be agriculture orientated. It was foreseen that access to communications and information would dramatically be increased for the people of Thabina, accelerating and bolstering sustainable development.

It was therefore decided that the Facilitator, well-known to the Development Committee, should address the Development Committee first, by explaining the new order, in order to put them at ease. Mody's (1991) advice is that media producers must first listen to representative samples of the larger audience, specifying *their* topic and treatment preferences. The basis of the audience dialogue-based methodology is to listen first, and then speak.

The focus of this project, according to the DSC paradigm, was not a 'communicator' but a more 'receiver-centric' orientation, with the resultant emphasis on meaning sought and ascribed rather than information transmitted. The researcher would respond rather than dictate, and then choose what was relevant to the context of the pilot project: "The emphasis is on information exchange rather than on the persuasion..." (Servaes, 1995:46).

This can be regarded as preproduction audience research. It investigated what the intended audience (Development Committee) knew and wanted to know on the topic area assigned to the production team or, in this case, the Researcher and Facilitator (Mody, 1991). Preproduction audience research identifies community fears and insecurities in addition to community strengths that could be used by the researcher in order to achieve the goal. It was also taken into consideration that a researcher from a different background may potentially be more objective in the process - this was applicable as the Researcher came from a city of the developed world, and the Development Committee came from a developing world. Given the differences of unlike backgrounds between the Researcher and Development Committee, it was crucial to study their information processing behaviours before designing a project for them. Such data collection helps remove the need for "guesstimates" (Mody, 1991), such as what a telecentre comprises and where it would fit into the management of the WUA, the various ICTs provided by a telecentre and what information could be obtained from these technologies.

This process followed Mody's guidelines (1991) on how to collect information on audiences and topics to:

- Go from the known to the unknown – start with confirming existing knowledge on the audience and program topic. Then, proceed to questions you know nothing about. Talk to those who have spent time investigating answers to the questions you have in mind.
- Go from the general to the particular – start with observing the total situation in which the community lives, e.g. how land and capital resources are distributed. Then

proceed to details. Observations will save the team from asking unnecessary questions and point toward relevant subsequent questions about why people behave the way they do (Mody, 1991).

4.2.1 The first workshop

Dr Jon Rutherfoord was contacted by the Researcher and the first workshop with the Development Committee which took place during March 2000, was arranged. The aim of the workshop was to explain the WUA's situation, the concept of a telecentre and the various ICTs which could be made available by the telecentre. First of all, the various role-players were identified:

- Dr Jon Rutherfoord of LVA could be seen as the **facilitator.** As explained before, he was appointed by the Department of Agriculture, Land and Environment of the Northern Province, as consultant, to rehabilitate and upgrade the existing irrigation scheme at Thabina. According to Malan & Grossberg (1998), as the facilitator, he had the crucial role of facilitating between all major agents in order to keep the development process on track.
- The Researcher could be seen as both the **developer** and the **project leader** and played the leading role in the planning of the pilot project based on the DSC paradigm, as the planning was done from outside the community, implemented at grassroots level and group and interpersonal communication was used to create a climate of mutual understanding.
- The **stakeholders** were the various parties with an interest in the development project (Malan & Grossberg, 1998). They were the researcher, Dr Jon Rutherfoord and Johann Adendorff of LVA, and the Development Committee on behalf of the community.
- The **Development Committee,** chosen by the community, was the most powerful body in the chain of decision-making and communication, as the aim was to address their needs.

Before the workshop commenced, the Facilitator explained the objectives and the long-term perspective of the pilot project that was agreed upon by the Researcher and the Facilitator. These aspects were discussed in detail with the Development Committee by means of interpersonal, participant communication. The role-players agreed on these aspects. By means of story-telling, as described under Story-telling to

accommodate indigenous culture, in 4.4.1.1 on page 83, Mr Johann Adendorff explained where the telecentre would fit into the management of their WUA.

The newer approaches to development communication also argue that the point of departure must be the community. "What is essential, is that people are assisted to develop a critical consciousness of their situation … so that they become the architects of their own destination" (Agunga, 1998:29). In his opening address of the first workshop held with the role-players, Dr Jon Rutherfoord, as facilitator, explained the new order formed at Thabina - the recently established WUA, as described earlier - and said that the Government would no longer do everything for them. Thabina would therefore need communication and information to be able to farm successfully. The Development Committee would need to keep record of everything that happened and they might benefit from a pilot project where information and communication services would be made available. As the WUA was established in this agricultural society, Thabina would increasingly need information on agricultural practices as well as a means by which to communicate with other agriculture-related organisations. It was at the local community level that the problems of living conditions, such as the lack of technology, were discussed.

In reaction to this, the Development Committee expressed the wish to become a self-sustainable community by means of the information and communication these technologies could offer them.

According to Bie (1996), current evidence suggests that to achieve sustainability and success, Internet projects for rural development must begin with the real needs of the local community. This required an approach that catalysed local participation, supported the information and communication needs assessment, built awareness of potential Internet uses, helped build the community of users, and built locally managed and ultimately self-supporting communication and information networks. The Facilitator explained to the Development Committee that this project would be based on the information needs, derived from the practical needs as expressed by them during a previous survey done by the Facilitator. The information to be obtained from these technologies, would address these information needs. He also explained, that with the implementation of a telecentre, they would also have means of communicating with other agriculture-related organisations.

4.2.2 Explaining the meaning of the concept 'telecentre': a presentation

During the workshop, the research method and data collection technique was in the form of focus group discussion. A translator (teacher) translated the questions of the Development Committee into English and the answers into the indigenous language for the Community Members. The Development Committee had questions on how they could be taught to operate these technologies and on the possibility of theft. There were also questions on the available information and on which technologies were to be demonstrated at a later workshop.

After explaining the new order (WUA), the meaning of the term 'telecentre' was explained to the Development Committee by the Researcher. It was explained that for this pilot project, a telecentre would comprise a building with the various technologies such as a fax, photocopier and a computer with a modem and Internet facilities from which information could be obtained and by which means communication could take place. A telephone line and electricity would have to be installed before the various technologies could be applied. As the technologies were a new concept to the members of the Development Committee, it was agreed during the workshop, that the various technologies should be demonstrated to them during a later workshop.

Questions asked included questions on the information that could be obtained from the technology. The researcher explained that information regarding the following could be obtained: any market prices could be obtained on a daily basis; market trends; diseases of, and the processing of various crops; trade and fresh produce prices; and the register of South African Agricultural press. Socio-cultural sensitivity was also critical in deciding what was to be communicated and how it should be communicated, i.e. topics, treatment, and channel selection. It was decided that the topic would be what agricultural information could be obtained from the technologies and that it should be done by means of interpersonal, participatant communication. This was particularly important, as the content was counter to their culture. Although the technologies were totally new to the Development Committee, they agreed that they definitely needed this kind of information. The only concern of the Committee members was that they had no funds and it would not be possible to buy these technologies. It was then explained to them that once their letter of consent was obtained, donor companies would be approached to finance the telecentre. As the

technologies were also a new concept to the Development Committee, they asked for a demonstration thereof, which would be arranged for a future date.

During the workshop, the question posed by the Facilitator was what *requirement* information should meet (Boon, 1992) for development. As it was difficult for an outsider to determine the needs of a community, it was agreed upon that the Researcher would do an in-depth analysis of the needs of the Development Committee, as mentioned earlier on and previously executed by the Facilitator, Dr Rutherfoord, to establish the requirement the available information should meet.

An analysis of the workshop (which was taped by a tape recorder) also revealed that the Development Committee needed information on agricultural aspects such as market prices and trends, the weather, plant diseases and the cure thereof, as well as where further information could be obtained from, such as the agricultural press, which could be made available to them by means of the technologies of a telecentre.

During the workshop, the Development Committee members were supported and assisted to manage their own development by exposing them to the appropriate agriculture-related information, and the facilities, training and services that could be rendered by their telecentre. According to Rogers (1973:44), there are four crucial steps left in the process of diffusion and adoption: The knowledge of the innovation itself (information), the communication of the innovation (persuasion), the decision to adopt or reject the innovation (adoption or rejection), and the confirmation of the innovation by the individual. It is important to note that Lerner (1958:44), mentioned the importance of empathy, which is an indispensable skill for people moving out of traditional settings – the individual-psychological capacity of people to adjust themselves to modern environments.

To share information, knowledge, trust, commitment, and a right attitude in development projects, participation would be very important in the decision-making process for the development of this community. During the pre-production audience research, it was evident that the members of the Development Committee were all very emphatic to change – they were all convinced that by using the various technologies, their community would develop towards self-sustainability.

Four members of the Development Committee asked for a brief introduction to the technologies that could be made available by means of a telecentre, and although it

was not planned by the Researcher, it seemed expedient to give the Development Committee a short introduction to the various technologies, which was done by the Researcher.

The following ICTs that could be made available by means of a telecentre were briefly explained to the Development Committee by the Researcher (see detailed explanation in the next chapter). This was not an easy task, as it had to be done without a computer. The following elements of a computer were explained by means of gestures of the hands:

- The computer: monitor, mouse, handling (opening, closing) of existing and new files and the keyboard.
- Internet:
  - search programs
  - various applicable Web sites to obtain agricultural information
  - e-mail: various agriculture-related addresses and how to send and receive messages.

The aim of explaining the ICTs, was to inform the Development Committee of the available ICTs, what information could be obtained from these technologies and the uses thereof.

Before the closing of the workshop, Mr Johann Adendorff explained to the Development Committee where the telecentre would fit into the management of their WUA. This is described in 4.4.1.1 on page 83.

At the closing of the workshop, the role-players decided that an in-depth demonstration of the various technologies should be held at a later workshop. The Researcher told the other role-players that before she could decide which technologies and what information to be obtained from these technologies should be demonstrated, it was necessary for her to perform an assessment of the information needs of the Development Committee. The Researcher would then explain to them at a later workshop how these information needs could be addressed by the various technologies provided by a telecentre.

4.2.3 Individual interviews

Personal interviews were held with Development Committee members after the workshop to obtain each members' opinion, as the community of Thabina was an oral

society and mostly illiterate. In accordance with the exploratory nature of the study, the interviews could be typed as 'standardised open-ended' as the questions were open-ended and the wording and sequence of questions were decided upon in advance, allowing for coverage of all issues and the comparison of responses. On the question of whether they were satisfied with the identification of the role-players, they all agreed, especially on the fact that Dr Jon Rutherfoord would be the facilitator. This was seen by the Researcher as due to the fact that he was well known to the Development Committee, had been working with them for several years, and was trusted by them. It also became clear that as they understood the concept of the WUA established at their irrigation scheme, they all agreed that they would now need to communicate with other WUA's. It also became clear that, although it was a new concept to them, they more or less understood the term 'telecentre'. They did, however, ask various questions on whether they would be able to "work" the computer. It was explained at each interview that an in-depth demonstration would be held in order for them to become familiar with the operation of a computer. Questions on the information to be obtained were also asked by several members of the Development Committee, and it was therefore necessary to explain to them that the Researcher would first have to identify their information needs. It was also again explained to them that the information needs would be based on the needs as determined by a previous survey done by LVA.

4.3 IDENTIFICATION OF INFORMATION NEEDS

Research into the information needs of the community of Thabina was seen as of cardinal importance, as the tendency of many donor agencies to invest in multi-million dollar projects without making a systematic effort to understand the real needs of the people, was a(nother) reason - for delusion, disappointment and failures (Agunga, 1998 and Hammer, 1994).

It was therefore a most important aspect of the pilot project to investigate what the practical needs and aspirations of the Development Committee were, and how it could be addressed in order for the community to become self-sustainable. As the paradigm of DSC was used for the pilot project, indigenous cultural knowledge formed the framework. The Researcher obtained an exposé of the practical problems, needs, fears and aspirations as expressed by the Development Committee. An in-depth survey of these aspects was done by the consultants LVA, during the application of the Development Committee for a WUA.

How the practical needs assessment was done

This pre-development survey was undertaken by the consultants LVA, according to the guidelines and checklists for trainers and development facilitators. These guidelines were compiled as a report to the Water Research Commission on the project: "The Development of Guidelines for approriate Training Levels and Content in support of Sustainable Small-scale Irrigation Development". These guidelines are based on the argument that community members and outsider role-players involved in irrigation development need to be much better informed of their own and other players' roles in the development to increase the chances of success.

Fears and perceptions of South Africa's rural poor is based on people's own analysis of their circumstances and should therefore not be read as a paternalistic viewpoint of 'outsiders'. These results were obtained from fieldwork and was also observed during subsequent work in the Northern Province and Eastern Cape. It is thus assumed that developers and trainers are likely to encounter similar situations elsewhere in South Africa. Farmers should be allowed to participate voluntarily in the proposed training programme. Voluntary participation in training therefore implies that participants have decided to continue with agriculture and want to improve their current practices.

4.3.1 Interaction with interviewers/prospective trainers

The prospective trainers are used as interviewers to do the pre-development survey, which brings them in close contact with the community they will be working in. The facilitator sensitises interviewers prior to fieldwork and trains them on how to conduct the interviews with empathy and understanding. The interviewers share their thoughts and experiences after each session of interviews, with an emphasis on personal experience and understanding of the social and technical aspects of the situation. The survey team compile a list of the needs, problems, fears and aspirations (NPFA).

4.3.2 Interaction with the community

The facilitator and interviewers meet with the community (after permission was obtained from the community leadership) in mass meetings, groups and individual interviews. Participative techniques are used to analyse poverty levels and expectations of the community. Observation and measurements are used to assess and analyse current agricultural practice, and report-back meetings with the community and other role-players are arranged through the community leaders.

The survey results are presented for confirmation by the community during the report-back meeting with the community. The community adopts the results of the survey (NPFA) as a true reflection of the current situation and a basis for development intervention, by nominating representatives to sign the document on their behalf. A possible approach is discussed, including the need for the formation of training groups, and an action plan is developed. The survey team meets with the community leadership to conclude the survey.

4.3.3 Analysing practical problems, needs, fears and aspirations (PNFA)

In order to identify information needs, the Researcher did the analysis of the practical problems, needs, fears and aspirations herself by analysing each individual practical problem, need, fear and aspiration. Various Web sites were visited in order to establish whether applicable information could be obtained by means of which it could be addressed. Web sites from which information could be obtained included the ARC (with various institutes which comprise information on soil, water, climate, engineering, irrigation, fungicides and pesticides), Agrimark and SAFEX.

These aspects expressed by the community were all agriculture related, as they are a farming community, which earns its income by means of farming practices. It was now the task of the Researcher to do an in-depth analysis of each of these aspects to determine what the information needs of the Development Committee would comprise – based on these various aspects.

The exposé of practical needs expressed by the Development Committee formed the basis of the identification of information needs. It was intended to find out what the Development Committee wanted to know and in what form this information would get their attention. Mody (1991) explains that the persons' position in society and the nature of that society (and economy and culture) influence his/her interests and information needs.

Those people who are involved with development at the operational level need information to facilitate development, and during this period, before the demonstration, as much information as possible on the practical needs of the Development Committee was analysed and noted for later use during the implementation of the pilot project. Information was needed on aspects such as

- optimal agricultural methods that are adaptable to the specific region,

- information on markets, as well as on
- demand and supply.

Boon (1992) warns that the developer should also be up-to-date with other fields of development - agricultural development may not take place in isolation from development in other fields such as educational or community development. For the pilot project, however, only agricultural needs were investigated, as Thabina is a farming community. It was foreseen by the Researcher, though, that the pilot project could later be developed into a wider project such as the implementation of a MPCC, where the community would be able to obtain information on matters such as tele-medicine, tele-schooling, etc.

The practical problems, needs, fears and aspirations expressed by the Development Committee, which was analysed in detail by the Researcher, comprised the following:

PRACTICAL PROBLEMS, NEEDS, FEARS AND ASPIRATIONS (PNFA)

PROBLEMS, NEEDS, FEARS AND ASPIRATIONS OF FARMERS AT THABINA IRRIGATION SCHEME.

PROBLEMS	NEEDS	FEARS	ASPIRATIONS
INFRASTRUCTURE AND LAND ISSUES			
Inadequate water for irrigation.	Reliable water sources needed e.g. construction of a dam, or drilling of bore-holes.	Drought and therefore hunger.	Sufficient irrigation water which will ensure food security
Damaged main canal and sub canals.	Repairs and upgrading of canals.		Scheme rehabilitation.
Inadequate water pumps and frequent breakdown of pumps.	Repairs to broken down pumps and additional pumps needed.		
Poor water flow in the lands.	Land levelling.	Poor irrigation.	
Poor access to water for drinking (Lefara Village)	Upgrade the domestic water pipe system.		
Lack of title deeds to land.		Loss of land to government.	To own the land, invest in high value crops and become self sufficient.
Soil erosion a problem as contours have been ploughed down.	Construction of contours to prevent soil erosion by water.	Soil loss and nowhere to farm in future.	
Farm sizes inadequate.	Open up more land for farming and new projects such as piggery, poultry for income.		Additional income from other sources.
Theft of produce in the lands. Thieves also cut fences allowing livestock to enter the scheme.	Security to prevent theft.	Hunger and deprived income.	Implementation of a security system.

PROBLEMS, NEEDS, FEARS AND ASPIRATIONS OF FARMERS AT THABINA IRRIGATION SCHEME.

PROBLEMS	NEEDS	FEARS	ASPIRATIONS
SERVICE ISSUES			
Shortage of tractors and poor tractor services.	Provision of adequate tractor services.	Low yields.	Better quality produce.
Poor service by Mpumulana Co-operative.	Upgrade the business management aspect of the co-operative.		Easy access to crop inputs.
Transport to markets is a problem.	A more efficient marketing system.	Loss of income.	Sale of good quality produce in order to improve income and have a better standard of living.
Poor performance by extension officers.	Transport and further training for the extension officers.	Low yields.	
Unavailability of vegetable seedlings.	Construction of a nursery to supply seedlings to farmers.		
Lack of credit facilities to purchase crop inputs and equipment.	Access to credit.	Poor production by farmers.	To become more productive farmers.
GENERAL ISSUES			
Farmers lack knowledge and skills on crop production under irrigation.	Further training of farmers in all production aspects.	Low quality produce and low yields	Self sufficiency.
Wild animals and rats feeding on produce or destroying crops.		Loss of produce.	
Walk long distance to clinic	Build clinic near Lefara		

By analysing these elements in detail, it could be determined how they could be addressed by the technologies offered by a telecentre. This exposé of practical needs therefore helped to identify the information requirements of the Development Committee, as it could be analysed in order to identify the information needs, based on it. It was important to uncover local skills and knowledge on the uses of technology. These two items would help guide the selection and development of applications and help make the technology useful and appropriate for these local people. Local skills and knowledge identified showed that a large amount of basic farming knowledge existed, but that local skills concerning the use of the technologies was non-existant. This became clear during the first workshop held with the Development Committee, where the question on whether they would be able to "work" the computer, arose.

Ample time was required for the assessment, as factors such as the availability of existing information and the level of use of ICTs had to be determined. As mentioned, the audit of needs is not a once-off audit, and the needs expressed by the Development Committee during the preparatory phase, were integrated with the practical needs expressed during the previous survey done by the consultants, LVA:

- **Practical needs**

  During the survey, conducted by the consultants LVA and the workshop, it became clear that most of the needs expressed by the Development Committee were agriculture related. It was also information related, as the Development Committee needed applicable information on these practical needs in order to address them.

- **Communication needs**

  The following aspects were analysed, and the various technologies and information to address these needs, now had to be identified:

4.3.4 Needs

The most important need was title deeds to land. It was foreseen that once a WUA was established, this was easier to obtain. By means of the ICTs provided by a telecentre, the Development Committee would be able to communicate with banks and other financial institutions in order to acquire financial assistance for developmental and operational costs.

Other practical needs identified included needs such as how to construct a dam or drill bore-holes, repairs, where to buy pumps, upgrade canals, construct contours, and information on a piggery and/or poultry for income. These needs were in fact information needs which could be addressed by means of information obtained from various Web sites, as well as by means of communication with various agriculture-related organisations by means of e-mail.

4.3.5 Problems

This farming community had to face various problems such as how to use irrigation water, how to repair canals and subcanals, the maintenance of water pumps, utilisation of water flow, access to drinking water, how to obtain title deeds, information on soil erosion, on how to enlarge farm sizes, and on how to secure against theft. It was foreseen that these problems could also be solved by using information obtained from the Internet, as well as by means of communication with various applicable agricultural organisations such as the Department of Agriculture: Water Use Management, the Water Research Commission, Department of Agriculture, Land and Environment and many others by means of e-mail and the fax.

4.3.6 Fears

The main fears of the community were poverty and/or hunger and droughts, as they were not well informed on sustainable farming practices. It was envisaged that these fears could be addressed through applicable information and communication, especially by information obtained from the Internet, such as on weather patterns, pesticides and fungicides, manure application, the making of compost, the sustainable cultivation of crops, which could be found on the Internet and various Web sites. Other fears identified were poor irrigation, loss of land to Government, soil loss and where to farm in future. Information on these aspects could also be obtained from the Internet and by means of the Web sites of various agriculture-related organisations. One of the fears mentioned, was the fear of loss of land to Government. Communication via telephone or e-mail with officials of the Department of Land Affairs could set their minds at ease in this regard. Once a telecentre was implemented, they would be able to make better progress with the farming, as they would then be able to obtain information that could lead to better farming practices.

4.3.7 Aspirations

Aspirations mentioned were sufficient irrigation water to ensure food security, scheme rehabilitation, to own the land, investment in high-value crops to become self sufficient, additional income from other sources and the implementation of a security system. It was decided that more information on these topics could be obtained from various Web sites such as the DWAF, National Department of Agriculture (NDA), and the ARC. Various Web sites of companies that implement security systems and of companies to be contacted when 'job hunting' are available on the Internet.

The existing irrigation scheme failed due to insufficient water supply, equipment and implements. Information on irrigation and water supply, as well as on the acquirement and maintenance of implements are made available by various companies by means of Web sites and the Internet. To the question, "what went wrong with the irrigation scheme?" the Researcher determined that the aspects which contributed to this failure were the lack of co-operatives, lack of markets, poor maintenance, lack of co-ordination between the farmers.

Information on management, co-ordination of farmers and farmer training were especially the type of information that could be obtained from the telecentre to address and resolve many of the current problems. Information on markets would also be received very well by the farmers, as this was one of the aspects that contributed to the failure of the scheme, i.e. where to sell, which prices were applicable and what crops to grow - according to the demands.

The Researcher found that the training of extension officers, the improvement of farming methods and improved access to markets would be necessary to upgrade the scheme. The improvement of farming methods and the provision of training to the farmers and extension staff were seen as necessary aspects to upgrade the scheme. During the second workshop with the Development Committee, the Researcher demonstrated methods of acquiring such information.

Conclusion

The ultimate purpose of knowledge sharing was to empower the rural people to take an increasing degree of control over their environment and agriculture. It so critically impinged upon their quality of life, that the Researcher decided to communicate in detail the conclusions drawn by the Development Committee at the next workshop. Boon, (1999)

stressed that in the field of the environment, information technology would help to expand humanity's capacity to understand and manage physical and ecological processes, and to forecast and respond to disasters and catastrophes. Information technologies would also make possible the establishment of better disaster warning systems.

It was decided to provide the information which the community wanted on agriculture and on how they would be able to obtain it through dialogue and by means of print-outs which would demonstrate the information that could be obtained from the computer via e-mail and the Internet.

It was evident that their basic needs involved information on agriculture, as they were a farming community making a living from agriculture, and that an 'attitude change' should be developed – change from a poor, underdeveloped community which needed information on agriculture, to a self-sustainable society, with the necessary information for development.

4.4 INTEGRATING INDIGENOUS CULTURE, DEVELOPMENT AND MANAGEMENT

Before integrating these aspects, a study had to be conducted by the Researcher on how, where and when Africans communicate – the indigenous communication systems, their knowledge of management, their views on development and their willingness to develop.

Integrating new information in African ways of communicating

Africa has a tradition of oral communication ranging from Hausa drummers, … town criers, mammy wagons and tro tros which ferry women traders between urban and rural Nigeria and matatus in Kenia. Messages are communicated orally, interactively, and democratically (Musaka, 1998:11). Villagers generate and regenerate culture by weaving it into proverbs, rhythms and drumbeats (Leach, 1999:84) – they still communicate the indigenous information. When the crops are in and the pace of life slows, there is time for cults and rites, for ancestor worship and rituals and for fun. Griots, storytellers and troubadours call on the villages. Puppeteers, theatre groups and women dancers perform. Drums pound through the long night. And in doing so they ensure the continuity of the culture (Decock, 1996:1). Indigenous technologies and transfer also comprise local materials and resources, and the transfer of skills to use them (Malan, 1998:76).

Indigenous information should be integrated with the new information (Leach, 1999:84), but can these indigenous means of communication provide those in rural villages in Africa with information that will help them to better meet basic needs, feed their children, keep their

families healthy, control their reproductive health and administer family resources? Can they show them how to win status and transform their lives from within their own culture? How do traditional communication networks – from midwives, healers and chiefs to markets, festivals and ceremonies – fit in with the more orthodox approaches to development communication? Are they the routes to grassroots participation, self-reliance and the use of local resources? "For a growing number of communication professionals, the answer is 'yes'" (Decock, 1996:1).

The importance of integrating new information with indigenous culture can not be stressed enough. In order for this specific community to be able to understand and internalise the new information, it was of cardinal importance to communicate it in a way that would be understandable and digestible for the community – in other words, to integrate local culture into the new messages to be communicated to the community. It was therefore decided to keep the language for the pilot project (English) as simple and understandable as possible and to use an interpreter.

Like most rural Africans, the population of Thabina lived outside the global information village. There were no satellite dishes, modems and computers in their world. Only one member of the Development Committee possessed a computer. To the other members of the Development Committee, this was a totally new concept.

But even though global high-tech is a world away and electronic media beyond their means, this rural community transmitted their social and cultural heritage through a communication environment that existed long before sophisticated modern information technologies. African villages have held on to a wealth of indigenous knowledge firmly embedded in the traditional mores and talents of generations past (Decock, 1996:2).

4.4.1 Integration of indigenous information

By means of conversations during the previous workshop, it became clear that the Development Committee, farmers that they are, had years of experience in the local farming practices. But, it also became clear that these farmers would need more information to enable them to eventually become self-sustainable - information that they could very easily obtain from the Internet and by means of communicating with other agricultural organisations, such as DWAF, the WRC and other WUA's.

Indigenous information or "what the people already know" was integrated with the provision of new information – it could be seen as laying the basis for and facilitating

the interactive nature of such provision. It was therefore taken into consideration that the Development Committee had a certain amount of knowledge and experience, such as on how to cultivate and which crops were suitable to cultivate in their area. It was a two-way street – while discussing issues with them, much was also learned from them. When traditional knowledge information is incorporated in the process, it becomes more integral to information sharing (Leach, 1999:82).

As communication at a participatory level, and close interaction with the community is essential for good cultural translation (Malan, 1998) each remark and question asked by the Development Committee was noted. Answers were given promptly, but most of the material demonstrated was explained by means of a demonstration, that would be described later on. Since Rivera and Erlich (1995:203) define culture as a collection of behaviours and beliefs that constitute standards for deciding what is, what can be and what to do about it, their list of a community organiser's qualities includes the following: cultural and racial identification with the community, familiarity with customs and traditions, social networks and values and an intimate knowledge of language and subgroup slang, in addition to analytical, organisational and other skills. Ideally these qualities also apply to the DSC facilitator.

The issue of indigenous information was taken into account by means of the DSC process - what the participants already knew, was integrated in the information supplied by them. Although the participants had a fair amount of farming knowledge, they were not at all familiar with the uses of technology from the developed world. According to Lowrey (1995:10-11), a key factor of accomplishment is attributed to culturally-based community participation: "If we put the culture back into agriculture, perhaps the rural poor will get the chance to be the authors of their of their own development". It was also explained to the Development Committee that "through the use of personal computers, modems and the telephone lines, a community could be established as a new global community – these networks successfully targeted key actors in the development process" (Hamelink, 1998:23) as a rural agricultural society.

Culture is no longer only an 'instrument' of socio-cultural reproduction, but has become a primary resource and an instrument of production. More over, the entire information evolution has a cultural basis. In their analysis of the profound influence that information will have in the coming economic revolution, which will change the

nature of employment and even the nations-state, Davidson and Rees-Mogg (1997:50) said, "Major transitions always involve a cultural revolution and usually entail clashes between adherents of the old and new values". The emergence of the so-called cyberculture represents a revolution on its own, and at this stage one can only speculate about its eventual influence on development as more and more communities attain access to the boundless networks and information of this cyberculture (Malan, 1998:51).

According to Malan (1998:66), (it) poses a challenging role for the DC facilitators at these centres, who should not only do the cultural translation of data and information at the centres, but should help establish a two-way communication flow that will allow informal, indigenous information to be fed into the system – end-users should be guided to perceive all forms of technology as non-threatening (Malan, 1998:77).

4.4.1.1 Story-telling to accommodate indigenous culture

The indigenous culture of the black communities of South Africa is based on story-telling. To make any new information and new concepts understandable, it should be made adaptable to the community's culture in order to be understood. These two view points formed the basis of the communication and explanation of the project by means of story-telling.

Mr Johann Adendorff of LVA was asked to explain to the members of the Development Committee the importance of the information they could obtain by means of the telecentre, and where the telecentre would fit into their development strategy. During the workshop he illustrated the situation by telling a story based on a wagon that was to be pulled from the mud:

The newly founded WUA is soon to be transferred from the Government to the local community of Thabina. The starting point was not only the aspect of legal transfer, but also of upgrading the infrastructure before walking away. It also included the creation of an environment for this scheme, so that it would be self-sustainable in the future. In order to create that environment, one should understand what existed at the moment, and Mr Adendorff explained the following analogue to the Development Committee on where and how the telecentre would fit into their development which included the following

elements and their meaning in the context of the specific community and their specific problems:

- **Wagon stuck in the mud**

The community was described as a wagon stuck in the mud. The mud refers to the unfulfilled needs and unfulfilled aspirations and the fears of the people of the community, *inter alia* problems like poverty. This analogue was immediately understood by the Development Committee because it was a description of the situation on the ground. So the wagon is now stuck in the mud and it is universal to all the current irrigation schemes – they are just like a wagon stuck in the mud. An environment should now be created where the farmers themselves, with the initial support of the Department of Agriculture, could pull that wagon out of the mud.

- **Driving seat**

The next point clearly described to the Development Committee was that this process should be people led. It should not be something that the Department does for them. The first step was then to establish a process of empowerment where the people take the responsibility for pulling the wagon out of the mud. That was very, very important - the starting point. The community elected the members of the Development Committee, as the people in the driving seats, while the people on the wagon represented the whole community – to be led by the Development Committee. The community also decides who from the outside they would like to have on board: is it the tribal authority, the TLC? It would be for them to decide who would be the key role-players. Having done that, it becomes a driving force – like the Board of Directors of a company. Because the Development Committee was elected by the community, it has the potential to become the Management Committee of the WUA in the future. Being elected by the people, the Development Committee would have more power and credibility, as well as being legal.

We now have a leadership and people who support that leadership. People who had identified their problems, needs and aspirations. But how do you address those problems identified by the community? The next step was to say, "what do we need and who do we need to ensure that we can address

these problems. We can not do it on our own, we might be able to do some of it on our own and we can not expect Government to do it all for us. Whoever we get to help us with this process, it must be done in a sustainable way, to last for ever, not only for today."

- **Spokes of the wheel**

The community elected the Development Committee to address their specific needs, which could be seen as the people being in the driving seat. Where communication and information was concerned, the Development Committee needed means of communication to communicate with other WUA's, with the DWAF and other agricultural organisations such as the WRC. They also needed information on many agricultural issues such as irrigation, irrigation schemes, fungicides and pesticides, fertiliser and crop-water management. These were seen as the spokes of the wheels – aspects that that should be addressed.

- **Oxen to pull the wagon from the mud**

The consultants and the Government were there at that stage and would maybe be there for a short time longer, but not for the following year. There was therefore a need to identify role-players, and these role-players constituted the oxen pulling the wagon. They were out in the veld, grazing. You could for instance have an ox who is a mechanisation contractor, it might be the Landbank, it might be the NTK which is a supplier of inputs, or any one that had a role to play, to help pulling the wagon from the mud. The community had identified these role-players. The Development Committee had many, many issues to take care of. They are farmers with decisions to make at policy level and it would not be as easy for them as to pick up the phone and say: "Mr NTK, we need this and that." With there being hundreds of farmers and their needs - say one bag of fertiliser, or half a packet of seed - all would have to be co-ordinated. Something, which all agreed, could be done by the manager of the telecentre, who would be the link between the suppliers' and the farmers' needs.

So, you have to go and fetch and bring these oxen into one span: make appointments with these role-players, bring them together and establish a

relationship with them, for them to help the community and determine the needs of the community. In this case, one of the identified oxen would be the telecentre that could provide the community with information and communication according to the needs of the community. This is how the idea of the telecentre originated – from the community's need for information and communication. The telecentre was seen as one of the oxen, a role player in the span of oxen to pull the wagon, i.e. the community, from the mud in which it was stuck. It was also very important for the oxen to pull in the same direction as a span – they should address all the issues, as the problems constitute the mud in which the wagon is stuck. Otherwise, the yoke would break and the wagon would not be able to move forwards.

- **Wagon-leader**

The management process was very difficult to handle from here. Management would have to know how to work a computer and get a database going, it would have to get information, write invoices, and collect money. The problem was that the farmers did not have the capacity or the time to do all those things themselves, so, in the long term, the Development Committee would have to appoint a manager - a manager who could guide the oxen between the stones. He/she would act on the orders of the Development Committee and be a link between the farmers' needs and the service providers. He would be the one to pull the oxen into a span and make them valuable. So he could call on a contractor, he could call on somebody from the National Department of Agriculture or somebody from the Agricultural Research Council, to come and help with technical training – any role-player that could act as one of the oxen. He does not have to be an expert in everything himself, but he would be the co-ordinator.

It was explained that the wagon-leader was the Chairman of the Development Committee. He should be the person to give the direction in which this wagon should be pulled – to self-sustainability. He would liaise with all the role-players and see that the wagon is pulled into the right direction – according to the needs of the community. Even the upgrading of the irrigation scheme was based on the specific problems and needs. At the end of the day, what ever happens on the ground, would be led by the process and not by Government.

The project would be sustainable in the sense that the community would eventually make their own decisions. The whole development approach would be need-based and people-driven – by the community itself.

4.5 DEMONSTRATION OF THE VARIOUS TECHNOLOGIES AND INFORMATION TO BE OBTAINED FROM THESE TECHNOLOGIES

Once the needs had been determined and the role of the telecentre explained, it was necessary to ensure that there was strong community commitment to support the introduction of the technology, believe in its benefits, value the products it generates and to create a climate in which these people would be happy to work with technology. Technophobia may hamper the adoption of information technologies (Beyers, 1996) – a rich history of using telecommunications locally to meet the needs of citizens would contribute to the success of a telecentre, but in rural areas where this is not present, ICTs could be experienced as 'alien' by many people. In such a case it would help to arrange technology demonstrations … and to engage the local population in all stages of the development of the project (Anderson, 1999:3), which was the next step in the pilot project.

It is necessary to ensure strong community commitment to (Richardson and Paisley, 1999):

- Support the introduction of the technology
- Believe in its benefits
- Value those who work with it and
- Value the products it generates and create a climate in which people are happy to work with technology

Second workshop with role-players in order to demonstrate the various ICTs and the information to be obtained from these technologies

The Facilitator arranged a second workshop with the various role-players, which took place during April 2000. Social marketing remains an ambiguous endeavor, suggesting as it does, that behavioral change can be directly traced back to the media stimulus – the need to learn what triggers action, and how social marketers can pull these triggers (Andreasen, 1995:316). Therefore, to ensure that the Development Committee fully understood what the new technologies would comprise, the demonstration of the uses of technology was held for the Development Committee as a group in a workshop situation. This demonstration was held in the same building where the previous workshop took place. In a study done by Leach

(1999:80), groups were viewed as "information channels": "... in rural areas information tends to filter down via those channels ... and so you have to tap into those channels if you want to gear information to them". Groups are referred to as more responsible, accountable, unlike just picking a person. The Development Committee was chosen by the community to be their leaders, and it was thus appropriate to communicate the new technologies to them as a group.

Background on workshop: Planning the demonstration

Top-down or blue-print planning still takes place whereby project decisions are made without planners even seeing the villages (Richardson, 1997), so development practitioners often find themselves in conflict with donor agency officials and government officials (such as Mr Shaker) who see communication as a process for control and marketing of top-down development agendas. The Researcher decided that the demonstration of the various technologies should be based on participant communication, where the members of the Development Committee could freely ask questions and answers could be supplied. She also decided that this demonstration should be based on the concept of participatory communication where "all the interlocutors are free and have equal access to the mean to express their viewpoints, feelings and experiences" (Bordenave, 1994:43) – the emphasis was on knowledge-sharing rather than top-down transmission of information and teaching.

This was exactly the reason why the needs assessment and the demonstration were executed – as Richardson (1997) mentioned, participatory communication initiatives are interventions that, ideally, enhance empowerment and peoples' participation in development. Oral communication was chosen for the execution of the demonstration as the words of Agunga (1998:41) were taken into account, "that when the appropriate communication input is present, projects tend to perform better". The demonstration was done on an interpersonal basis, and the English of the communicator was translated by a translator (local teacher) into the indigenous language of the community. According to Leach (1999:71) it was found that information provision is largely a participative, interactive process in which the oral or verbal method predominates.

Although "print based methods of providing information are, for various reasons – one of the major being that of illiteracy – often inappropriate in the rural context" (Leach, 1999:73), the printed material used was to support the dialogue and conversations, as a means to demonstrate the information to be obtained from the Internet.

The need for people involvement, assessing attitude and behavior toward innovations (Hammer, 1994:33) were taken into consideration throughout the demonstration, whereby alternative problems were identified: an applied, social scientific approach to development – one that combines the rigor of theory and the experience of real life. The challenge of the pilot project was also to make suggestions, not to give instructions.

Course of the workshop

Before the demonstration could commence, the Researcher explained to the Development Committee that the aim of the demonstration was to inform them how these ICTs - which were briefly explained to them by the Researcher during the previous workshop - could address their needs, fears and aspirations, as expressed by them during the survey previously done by LVA. The Researcher also explained that the practical needs, as expressed by the Development Committee during the survey by the consultants, would form the basis of the communication and discussion on how these agricultural needs could be integrated with the information needs. The researcher also decided that there should, as a start, be focused on these agriculture related needs, as information on tele-medicine and tele-schooling could also be obtained from various Web sites. There was undoubtedly a need for purposive communication, and practitioners should be involved in preparing media campaigns that will attack the information component of development needs, (therefore) audience characteristics, and our knowledge of them are central topics in what is generally called social marketing (Burton, 1998:89 and Richardson, 1997:5).

The information disseminated to the Development Committee by the Researcher included the uses of the computer (word processing, Web sites and Internet), the fax, the modem and the photocopier, as well as information that could be obtained from the Internet such as market information and trends, diseases on, and the processing of various crops, trade and fresh produce prices, the register of the South African agricultural press, etc.

To capture attention, print-outs of the various diseases on crops cultivated by this community were displayed and circulated. This drew their attention to the fact that the computer contains the kind of information they wanted and regarded as necessary for improvement. The various pesticides and fungicides to be used for the relevant diseases were also of great importance to them.

As there was no electricity, nor a telephone line, print-outs of the information to be obtained from various Web sites were introduced. Although illiterate, it was assumed that the

recipients would understand the print-outs, as they were in full colour to make them interesting, with simple illustrations that could be easily understood. However, the print-outs were not used as the main or the sole means of providing information. The main form of provision was oral and the print-outs were viewed as playing a minor role. Apart from being seen as a vehicle for communicating information they were seen as supporting and reinforcing what took place at an oral level. As such, the print-outs were also seen as something which one could leave behind, but which could be referred back to. They were also seen as something the recipients could go away with – as several of the print-outs were handed out to the members of the Development Committee.

To most of the members, the technologies were new and had to be introduced. Only one of the Development Committee members had a computer at home and was familiar with the use of this type of technology. Not only one type of technology was demonstrated, as proposed by Christensen (1997:8). 'Reconceptualisation' technologies, such as the Internet and computers, that could help redefine the educational environment and serve as a bridge to the future, were also demonstrated to the Development Committee.

For the purpose of the demonstration, the various technologies were explained to the Committee members:

4.5.1 Computer

Due to the lack of electricity in the building, the demonstration, which was done by the Researcher, was performed by means of a laptop that could be operated without electricity, and which was also small enough to be carried around to enable the members of the Development Committee to see the information explained on the monitor.

The uses of the various parts of a PC (personal computer) such as the monitor, the mouse, the cursor and the keyboard were explained in detail so that the recipients could get the full picture of the various parts of a PC. It was explained that the printed material to be used in the demonstration would be exactly the information seen on the monitor – in other words, that the print-outs to be used in the demonstration were exact copies of the information displayed on the monitor. After that, it was explained how to use the word processing facilities of the computer: how to type data, how it was stored in the memory and on a stiffy and how to regain the information stored on the computer.

4.5.2 Fax and e-mail

A fax-machine and its operation were also explained. A print-out of a fax message was shown, and the recipients were amazed at the speed by which information could reach them through the fax. The print-out contained the maize prices for that specific day.

One of the questions were whether this could be obtained on a daily basis. The answer was yes, but except on a Monday when no prices are available. This technology, they agreed, would come in very handy, as maize was one of the main crops cultivated by this community.

It was then explained that e-mail was one of the handiest electronic aids available these days: That it was fast, cheap and easy to reach more than one person at once. In an office set-up there are few people who do not communicate via e-mail on a daily basis, while the telephone lines start buzzing in the evenings as people are connecting instantly world wide, chatting and exchanging information.

It was explained to the committee members that through the computer, by means of E-mail, it would be much easier for them as a WUA to communicate with other companies and departments such as the NDA or the DWAF. Also that the information which could be obtained included information on irrigation and irrigation systems; crops and harvesting; crop-water requirements; markets and marketing; pesticides and fungicides; mechanization and conservation. They could for instance obtain the daily prices of products produced by themselves, as well as information on the various markets where it could be sold.

It was also explained to the Development Committee that they could obtain information on weather patterns and flood warnings through the fax and e-mail. This would enable them to know when to remove their irrigation equipment, in case of a flood warning. According to Richardson (1997), farmers do need information on market prices, market trends and weather patterns. The extension officer does not always have all the answers on soil types suitable for specific crops; which remedy to use for what disease; or how much water to apply during which month or week of the year.

4.5.3 Internet

(A full description on where to start and some handy hints are given in Appendix B).

It was explained how to find information fast on the Internet. In order to use the Internet, you need an Internet reader (i.e. Internet Explorer or Netscape Navigator). This software is part of a Windows package and should already be installed when you obtain the Internet service. One does not even have to be able to type - most of the Internet-work with the mouse.

A rural community such as Thabina represents the 'last mile of connectivity' challenge - as both developing countries and underdeveloped countries, with regard to access to Internet services and the telecommunication connections that help transmit services required. The question asked was how the Researcher could co-ordinate and support activities to assist this rural agricultural community in completing the last mile of connectivity.

It was felt that the Internet was well adapted and that its capital costs were relatively low: All that was required, was a personal computer, a modem and a normal telephone connection. The use of the telephone meant that only a small investment would be required to get to the Internet. Through the Web, information on diseases, the appearances of fungi's on the various crops and vegetables, photo images of what the diseases looked like and remedies therefore, in other words, information on pesticides and fungicides could also be obtained. Print-outs of information that could be obtained from the following Web sites were introduced as examples of information available on the Internet (Appendix C) - where applicable, the translator, a local teacher, translated the messages into the indigenous language:

- **Agricultural Research Council of South Africa** ***http://www.arc.agric.za/***

  This is the Web site of the statutory parastatal body, the ARC (Agricultural Research Council). This Web site contains the corporate profile, Web pages of the various institutes of the Council, publications, services, media releases and other links. It was explained that this body has several institutes from which information regarding the following could be obtained: cultivation of vegetables, plants and grain; information on tropical and subtropical plants; on fruit, vine and wine; on animal improvement, nutrition and products; veterinary information; information on soil, climate and water; as well as on agricultural engineering. It was also explained that due to the lack of electricity and a telephone line, the information available on the Internet would be explained by means of the print-outs.

Publications /Products and services and /Benza and Betty Info Cartoons were chosen. The subjects on the list of available info-cartoons read: Petrol engine maintenance; Diesel engine maintenance; Donkey cart; Ripper-planter; Cabbage; Beekeeping; Beetroot; Tomatoes; Carrots; Sorghum; Grain storage; Compost; Chemicals; Mulch; Soil sample; Rainwater; Rabies; Beef tapeworm; Hydatid tapeworm and Hookworm.

Print-outs of the info-cartoons were then shown and explained to the committee members - a full account of these print-outs, all in full colour, can be seen in Appendix D.

These Info-cartoons were very well received, as it was the kind of information this farming community needed. Although the information on the cartoons was in English, these colourful illustrations could be easily understood and little explanation of the cartoons was necessary. These cartoons were so popular, that they were distributed among the participants who asked for copies.

- From this Web site, the **AGIS-Web site** (Agricultural Geographical Information System) was chosen and the information obtained therefrom were: /agricultural info /list of products. *Potatoes and sunflower* were chosen for demonstration purposes:

Potatoes

A print-out of the fungal diseases on potatoes was shown – giving the common names as well as the scientific names. It was explained that the cursor could be moved to any common name, and a picture of the chosen disease would appear on the monitor. Various diseases were described on the print-outs. It was explained that by choosing a specific disease, information on the specific topic could be obtained. The print-out with the four pictures and the descriptions of the symptoms of the disease, were shown to the recipients.

Then ***Fungal*** diseases were chosen and a list of the various fungal diseases were shown. Various fungal diseases were mentioned on the print-out. This was also a matter, as explained to the recipients, where the cursor could be moved to a specific disease, and a coloured photo of the disease would appear on the screen.

The recipients were delighted by this information, as they understood that they would only have to move the cursor until they could find a picture of the disease found on their crops, which meant that they could not only obtain the name of the disease, but also the cure.

- **Institute for Agricultural Engineering**

  As the ARC has many institutes, the Institute for Agricultural Engineering was chosen from this Web site. A printout of the publications list was shown and it was explained that articles on irrigation, soil conservation, mechanisation, renewable energy and aquaculture could be obtained from this site. A list of publications to be obtained from this Web site was shown, as well as print-outs of articles concerning the designing of a low-cost shade-netting structure and flood irrigation. Both articles included photos of the subject, and made it easier for the recipients to understand.

- **Agri24:** ***http://www.agri24.com***

  This is a comprehensive agricultural web site from the Naspers 24 group, incorporating the previous Landbouweekblad on-line. It was explained that the following information could be obtained from this Web site: the latest weather forecasts; daily market prices and trends; a wide range of financial services; financial and economic indicators; and agricultural news.

  Information on market information / market prices was chosen and a printout of the current market prices was shown and discussed. A printout of the SAFEX trade prices was shown and the prices of grains, vegetables, fruit, oil seeds, meat, wool and mohair were discussed. Although it seemed complicated, the recipients understood that these were the daily prices of the various crops, and that it could be obtained on a daily basis. It was also explained that this Web site was linked to the Web site of Agrimark (*www.agrimark.co.za*) and that information regarding economics, trade, weather, grain crops, oilseeds, grain SA, field drops, horticulture, live stock and consultants Agri Management and Agricultural Outlook Conferences could be obtained from this Web site.

- **Aegean Academe, BP:** *http://www.agekon.com*

  On the print-out shown to the recipients, it was clear that information on various topics could be obtained by choosing one of the alternatives: Education; extension; research; seminar; comments; consultant; press; or links.

  The option ***Press*** was chosen and a printout of the various publications available in the agricultural sector was shown. The names of the publications

with the telephone numbers, fax numbers, e-mail addresses and Web sites of the contact persons all appeared on the printout. A copy of the Agricultural News, which could be obtained from this Web site, was shown as an example to them. It was of much interest to them, as an article on the establishment of the telecentre at their scheme featured in this edition.

Clippings of articles from other newspapers on the establishment of the telecentre at Thabina were also shown to the Development Committee. A copy of the registration form to receive the publications on this Web site, was also explained.

- **Pannar:** *http://www.pannarseed.co.za:* It was also explained that seed could be bought by various companies, through the Internet: Pannar, one of South Africa's foremost seed companies, has an impressive Web site.

  The extensive Web site of Pannar Seed provides valuable information on Pannar Seed and the companies in its group, as well as its wide range of products. The information is set out in logical order due to the well-designed Web site and Internet users can very easily find the information they need. The Web site makes provision for local and overseas users, as well as for enquiries and orders via e-mail.

  Apart from complete information on products, information regarding agronomy is regularly updated and provided to users. Pannar has a team of capable agronomists who work under the guidance of the well-known and respected Sydney Bondesio. When diseases and plagues become a problem for a crop-farmer, he can approach the company's plant pathologist, Dr Rikus Klopper. Enquiries may be made to ***infoserve@pannar.co.za***.

  Electronic trade is gradually increasing and will play a greater role in future. This service of Pannar enables the clients to place their seed orders fast. Clients may order their seed at *orders@pannar.co.za* - an interactive communication service - via e-mail. This web site is also linked to the following companies, which were briefly explained:

- **Starke Ayres** markets vegetable, flower and pasture seed. The company markets Pannar products in the Eastern and Western Cape and seed is also exported. Starke Ayres' Web site (*www.starkeayres.co.za*) provides its range

of products, as well as a news site containing important information to seed consumers.

- **Mascor** is a group consisting of several motor vehicle and agricultural equipment agencies. The agencies include Delta (Opel and Isuzu), John Deere Lawn and Garden, Toyota and Volkswagen.

  The Mascor Web site provides access to the company's lively trade in used vehicles and implements. Prices of these products are provided and enquiries can be made on *info@mascor.co.za.*

- **Kombat** produces and markets insecticides, weed killers and fungicides for the local and overseas market *(www.kombat.)* for information on crop tendencies and Seed Quest at *www.seedquest.comco.za).* Another interesting connection from the Pannar Web site is *www.agrimark.co.za*, for information on the seed trade.

The Development Committee as recipients of this information, were all delighted and expressed their astonishment at the large extent of information they could obtain from these various Web sites. It was also explained to them that this was a demonstration of only a few of all the Web sites available on the Internet. According to Mody (1991:30) information loss occurs when the audience does not receive part or all of the intended meaning and information distortion occurs when the meaning received by the audience is a modified form of the meaning that the production team intended to share. It was foreseen that this could happen during the demonstration, but it was foreseen that once the telecentre is implemented, more time would be spent with the Development Committee, in order to explain the operation of the ICTs and the information demonstrated to them. As the topic of the message was relevant to the Development Committee, motivation and ability to scrutinise issue-relevant arguments were high, and attitude changes that resulted were expected to last longer and to have a greater chance of leading to behavioral change. It was clear that the recipients felt that they could only but benefit from these technologies, which most of them had never heard of before. As mentioned earlier, they decided that a letter of agreement should be drawn up in order for the project to commence (Appendix E).

It was explained to the Development Committee that once the telecentre was established, more in-depth training would be provided on the uses of the ICTs and the information to be obtained from these technologies, as Burton, (1998:92) suggests that "... the majority of poor

people will be unlikely to fully utilise the information technology systems because of educational and affordability problems". But for the pilot project, it was made clear to the members of the Developing Committee that donor organisations would be contacted.

Due to a lack of time, information, other than those on agriculture, to be obtained from the Internet, were briefly explained. For the housewives there was information on tele-medicine, where only the name of the ailment is typed in and recommendations by a doctor as well as a list of remedies will appear on the monitor - in other words, lots of information on home and family care.

It was also explained that there were various other types of information that could be obtained from the Internet. For the youth, for instance, apart from all the games, there is information on where to apply for a job when job hunting; where to apply for further studies; and a whole curriculum with the explanation of various school subjects such as mathematics, etc. According to Richardson (1996), young people need to learn how to access and analyse information and the use of information and communication technologies.

During the workshop it was decided that a local extension officer would be appointed by the NPDALE as manager of the telecentre, and that she would be trained in the use of the various technologies by the Researcher. Roling and Engel (1991:128) contend that extension agents need training in "extension science", which they explained as an understanding of the "systematic use of communication to help farmers solve their problems". She was appointed due to the fact that she, as extension officer knew the problems of the farming community, and also because she had a keen interest in the operation of the ICTs.

After conclusion of the needs assessment and the demonstration, it was evident that communication was the key that opens the door to change - "It may well be the missing link in Africa's development puzzle" (Agunga, 1998:44).

CHAPTER V - EVALUATION PHASE

Synopsis

In this chapter the various core elements of the pilot project are evaluated. The successful use of participant observation and the workshop situation are described. This is followed by the evaluation of the various consecutive phases according to which the pilot project was executed. It could be said that during the evaluation phase it became clear that the pilot project was a success due to the fact that a telecentre would soon be established – the Development Committee realised that they could profit by the information provided by the ICTs of a telecentre, as well as the communication aspect by means of which they would be able to communicate with other organisations in the agricultural sector.

5.1 EVALUATION AS SUCH

Process evaluation refers to how the project was implemented, i.e. the attempt made to assess to what degree the strategy and work plan were implemented as planned, why changes were made and what lessons were learned for the establishment of a telecentre, was used to evaluate the pilot project:

Participant observation was used throughout the project. As the Researcher was unknown to the members of the Development Committee at whom this project was aimed, it was decided that Mr Johann Adendorff, who was well known to the community and who was trusted by them, would do the introduction to put the Development Committee at ease. During both the workshops held with the role-players, the atmosphere was relaxed due to Mr Johann Adendorff, who set the members of the Development Committee at ease. This relaxed atmosphere also contributed to the fact that the members of the Development Committee had not only the confidence to express their opinions, but also to ask questions. The incorporation of the indigenous culture by means of story-telling, also contributed to the relaxed atmosphere, as the Development Committee could understand this analogue very well – it was an example of an aspect with which they were familiar.

Throughout the explanation of where the telecentre would fit into their traditional communications system and their indigenous knowledge system, thorough observation was executed to observe and affirm that the Development Committee definitely agreed that they

needed a telecentre. This was of crucial importance, because if the results were negative, the project would not commence.

Participant observation was also applied during the demonstration phase, where the various technologies and the information to be obtained from these technologies were explained. Various questions concerning this subject were asked and, by means of participant observation, various additional needs were identified, such as information on water management, markets and cultivation, as well as on how to communicate by means of the e-mail and fax.

During this study, community involvement was clearly of the utmost importance - the specific needs of the community had to be analysed and applicable means to address these needs found. For the pilot project, the information to be obtained from the technologies provided by a telecentre, were the most applicable, in order to address this community's information needs. These needs were all agriculture related, as the community of Thabina is a farming community and a large amount of information on agriculture could be obtained from the Internet and various Web sites.

5.2 EVALUATION OF THE VARIOUS PHASES OF THE PILOT PROJECT:

5.2.1 Obtaining consent from the Director to execute the pilot project in the Northern Province

This aspect was necessary as Mr Massoud Shaker was appointed by the Government to upgrade the irrigation schemes in the Northern Province and as mentioned earlier, Thabina was one of the schemes he identified to be upgraded. The establishment of a telecentre was also seen by him as of cardinal value. The meetings arranged with Mr Shaker to discuss what the telecentre would comprise, could be seen as being very successful, as it contributed to the fact that he agreed to commence with the pilot project. The fact that a successful telecentre initiative was visited by him, also contributed to his consent to establish a telecentre at Thabina. It was also explained to him that most of the current telecentres failed, because they were dropped as 'from the sky' – in such cases no needs analysis were made beforehand to determine what kind of information was needed by a particular community. It was therefore explained to him that a needs assessment, as well as a demonstration, would be done in order to determine whether such a telecentre could provide in the needs of the Thabina

community. This phase was successful in terms of the fact that a letter of consent was received from Mr Shaker shortly after the meetings.

5.2.2 Obtaining the consent of the Development Committee to establish a telecentre at their WUA

Initially, the members of the Development Committee were skeptical of the idea of introducing a telecentre to their community, as this was a totally new concept to them. But Mr Adendorff explained to them, by means of story-telling, where the telecentre would fit into their development. This was well understood by this farming community, as the analogue of the wagon stuck in the mud (as explained in the previous chapter), was used. After the term 'telecentre' was explained, they had various questions on how they could obtain information from the technology, and it was decided to hold a demonstration. Their biggest problem however, was the aspect of funding, as the Development Committee had no money to invest in such a venture, so it was explained to them that funding organisations would be contacted. This phase could also be seen as a success, as the Development Committee was so interested in the various ICTs, that they requested a demonstration.

5.2.3 Demonstration of the ICTs

The demonstration of the various technologies and the information to be obtained therefrom, was also a great success. The recipients expressed their amazement at the various uses of the technologies, as well as at the large amount of information that could be obtained from these technologies. The printed material consisted of print-outs of information to be obtained, and was used to support the oral communication. As many of the print-outs were in full colour, of easily understandable sketches, it could be understood very well by this mostly illiterate and definitely computer-illiterate community. It was very clear that this information would address their information needs and that the information was needed by the community. The Development Committee was so excited about the new information demonstrated and explained to them, that several of the print-outs were handed out to be taken home by them.

After the demonstration, the Development Committee expressed the need for a telecentre that would comprise the various technologies and information to be obtained from them. They also wrote a letter of agreement (Appendix E) for the

telecentre to be established in their community, which clearly indicates that this demonstration was a huge success.

5.2.4 Information needs assessment

The practical needs, fears and expectations were, as mentioned, expressed by the Development Committee during a survey conducted by LVA. After the Researcher made an in-depth study thereof, it became very clear that the information needed by this agricultural community was for information regarding agriculture-related issues, especially market-related information and information on various pesticides and fungicides – to enable the farmers to increase the quality of their crops and thereby increase their income, as one of the main fears mentioned was the fear of poverty and hunger. Farmer training and the training of the extension officer were also mentioned as being of high priority. It also became clear that the establishment of needs was an ongoing process, as various additional needs were mentioned during the demonstration phase. As the process of communication progressed during the project, the recipients had the frankness to point out additional needs such as information on the market prices, fungicides and pesticides and information on weather patterns. The information needs assessment was a success, as the material demonstrated to the Development Committee, was based on this assessment, as the information was needed to address their needs.

5.2.5 Incorporating indigenous culture

To portray the telecentre as one of the oxen that was to pull the wagon from the mud was indeed a successful analogue. The wagon is an integral part of the recipients' indigenous culture and forms part of their everyday lives. The cultural discourse within the project was established and it could well be said that the general development discourse was an integration of discourses at the level of technical development planning (technocratic developmentalism) and community involvement (related culture). This definitely contributed to the success of the project – where the community decided they could benefit from the technologies and information provided by a telecentre, and also that the pilot project as such should proceed.

5.2.6 Development Support Communication as a tool of the project

The fact that a 'community first' approach was followed, contributed to the success of the pilot project. This approach made the community the sender or source of the

development communication designed to meet their needs, and organised a one-way monologue into a circular dialogue. During all the phases and by means of participant observation, it was clear that the recipients were at ease with the situation – although the technologies were very new to their culture, as well as existing knowledge of this oral society. The translations done by the widely known schoolteacher contributed to the fact that the recipients could easily understand the terms of communication used. Due to the fact that it was based on the DSC paradigm, the pilot project could be evaluated as certainly being successful. It was agency-based, as the Researcher sat down with the Development Committee in order to discuss their information needs, explaining that the pilot project was based on their practical needs as decided on during a survey done in collaboration with them by LVA. There was also horizontal knowledge-sharing between the role-players: existing information was integrated with the new information communicated by the researcher. In addition, a climate of mutual understanding was created by means of group and interpersonal communication. The pilot project was thus executed at grassroots level.

CHAPTER VI - INTERPRETATION, CONCLUSIONS AND RECOMMENDATIONS

Synopsis

This chapter comprises an interpretation of the various aspects of the pilot project, conclusions are drawn and recommendations are made. The basis of any project aimed at development, namely the communication aspect, and specifically the importance of DSC, proved to be of cardinal importance during every project that was to be implemented in a rural agricultural community.

The aspect of time-related issues is also important, as the developer/researcher is usually from a developed world where time is precious and plays an important role. It should therefore be borne in mind that rural people need time, and definitely take their time to make decisions. The information needs assessment and the demonstration are also described, and attention is given to the workshop situation, which seemed to be the optimal situation for participatory communication.

6.1 THE PARTICIPANT COMMUNICATION PROCESS

One of the first objectives of the pilot project was to enter into dialogue with the various role-players and that community involvement would form the basis of the pilot project. The importance of the DSC process during a project that involves communication between parties from the developed world and the developing world, can not be emphasised enough, and will therefore be discussed first. Although the DSC paradigm formed the basis of the pilot project, the top-down communication can not always be avoided, as explained by Malan & Grossberg (1998). The Development Committee had no insight into the use of ICTs, and the whole concept had to be explained to them by the Researcher. The Researcher therefore basically determined the development agenda and was instrumental in explaining the concept of a telecentre and the various ICTs, but it must also be noted that the members of the Development Committee did ask various questions, mainly during the discussion on their needs, and specifically on how the information they needed to address their needs could be obtained. It became evident that feedback - which is a very important aspect of participant communication - existed throughout the pilot project.

It is easy for parties of the developed world – sometimes from various different continents – to get together at a seminar or workshop to discuss various different or common issues. It is

in their culture to get together with strangers and then to immediately sit around a table discussing issues related to their work, and to immediately make decisions or draw conclusions. But for people from the developing world, it is not as comfortable a situation. DSC should seek to integrate people's culture, attitudes, knowledge, perceptions and problems. Firstly, and most importantly, *listen* to the members of the community to be developed – what their needs and aspirations and fears are. Listen to what they have to say and respect their attitude and thereby build mutual trust, the one element that was sought to be established in this pilot project. As mentioned, this contributed largely to the success of the project and can therefore be seen as one of the best practices.

According to Malan & Grossberg (1998), formal and informal communication should be balanced and it can well be said that this was obtained throughout this project. Both workshops were opened with a prayer - by a person appointed by the Chairman of the Development Committee. It is also worthwhile noting that a woman (the extension officer) was asked to open the workshop with a prayer at the first workshop. The common stereotyping of Africans, such as that women always play a subordinate role in the culture of rural Africans, was thereby proved to be unjust - as the opportunity to open a workshop or meeting with a prayer is, in the African culture, only granted to those of whom they have a high opinion.

During the pilot project, it was clear that "everything boils down to communication, understanding and establishing reasonable expectations" (Hammer, 1994:32). To communicate with people of a different culture and therefore of a different language, was also experienced as a complex factor in the communication process. It was experienced as a time-consuming process, where the translator had to translate every two sentences into the indigenous language – or, for that matter, into English for the Researcher. Communication would have been much easier if the Researcher had been able to speak the local language, as indicated by Malan (1998). This brings us to the aspect of time-related issues as discussed below.

6.2 TIME-RELATED ISSUES

DSC as a process is generally directed towards a developing community, and their perception of time is practically the opposite of that of the people from the developed world. They operate as if they have all the time in the world to execute some task, and not for nothing: they are used to standing and waiting for hours in long queues – for water with their water cans, for medication at the local clinic or for food at the local shop. The best practices of all

is to be prepared never to be in a hurry, or become restless, or agitated. This will immediately be noticed (if perhaps only through body language), as these rural people are very sensitive to the attitudes of others toward them.

The best practice is to make ample, if not extensive time for the communications and negotiations, as full participation and involvement takes time (Malan & Grossberg, 1998). A comprehensive and endogenously based communication strategy is one of the most vital components of a project aimed at development.

The first aspect that could be mentioned here was the time allocated to the workshops. They were both arranged to commence at 09:00 on the mornings of the dates fixed. While the Researcher hurried to be in time for the meetings, the members of the Development Committee turned up one by one, chatting and laughing and in no hurry at all. Not one of the workshops started at the appointed time. This could be seriously frustrating to a person from the developed world, but keep in mind that in the developing world, time is definitely not an issue – it is a culture in which time plays but a minimal role.

The second aspect that could be mentioned here was the time consumed by the communication process, as previously mentioned. It was complicated and endlessly time consuming to explain and demonstrate a concept such as the various ICTs by means of a translator who had to translate every second sentence uttered. For him then to take his time to translate each question into English, also took up much time. The best practice would be to make ample time for this process if the communicator does not speak or understand the indigenous language.

It can also be seen as good practice to explain the various issues in a very simple and understandable way - simple enough not to be too technical but sophisticated enough for the communicator not to be seen as underestimating the intelligence of the translator or for that matter, that of the recipients. In other words, take the indigenous culture into account. It can be mentioned here that the analogue of the wagon stuck in the mud was a concept well received. It was an aspect that formed a part of their indigenous culture and the Development Committee understood it very well - the language used by Mr Adendorff and the Researcher was easily understood and translated into the indigenous language.

It is also necessary to note here that these rural people need time to make decisions. During a meeting they will not agree or disagree with an issue. They have to go home, think it over and discuss it with each other. They will express their opinion only at a following meeting,

which can be very time consuming, especially from a Western perspective of the developed world. They really do need time, especially in a situation concerning development, where they are subjected to messages that could have a cardinal effect on their lives and would lead to fundamental changes.

6.3 INFORMATION NEEDS ASSESSMENT

The importance of a needs analysis and a demonstration of the information to be obtained from the ICTs can not be emphasised enough – only once the community realises that they need the technologies that a telecentre can provide, the establishment of such a centre can proceed.

The preliminary research into a development community, their practical needs and their communication systems, can be seen as one of the most important elements in a project aimed at implementing a telecentre in a rural agricultural area. As quoted earlier from Servaes (1995), and according to the DSC paradigm, the point of departure must be the community itself and the people should be assisted to develop a critical consciousness of their own situation. It was also very clear that the establishment of needs was not a once-off audit, but an ongoing process: various additional needs were explained during the implementation phase. Each need addressed led to another expressed, and finally all the ideas mentioned were integrated with the needs as mentioned during the survey done beforehand by LVA.

It became clear that human development can only be achieved when people are empowered to become critically conscious of their social, economic and physical circumstances and on how to use their creativity to improve the quality of their lives in a sustainable manner. People should be encouraged to become involved in 'information-seeking behaviour'. It was therefore necessary to spend time helping them to understand the value of the telecentre and how the information obtained from the technologies could address their needs. As mentioned earlier, the focus of this project moved from a 'communicator' to a more 'receiver-centric' orientation – needs expressed by the Development Committee were rather responded to, than to inform them of their needs. This surely contributed to the members of the Development Committee trusting, not only the communicator, but also the new information presented to them.

6.4 DEMONSTRATION OF THE VARIOUS TECHNOLOGIES

As mentioned, the members of the Development Committee asked for a demonstration of the various ICTs immediately after the explanation of the term 'telecentre'. Such a demonstration

can be seen as a good practice, as it gives the recipients a reliable indication of what such a venture would comprise. Technology is surely one of the most difficult terms to be understood by any illiterate community, but by means of a detailed demonstration thereof, all fears could be addressed.

It is also good practice to start with the very simple (to the western world) aspects to be demonstrated. For this project, concepts like a file, the use of the mouse, the application of the monitor, the memory of the computer and the use of a stiffie to store files (information), as well as the fax and photocopier were explained first.

After the Researcher was sure that the recipients understood the computer, the various applications of the computer were discussed and demonstrated. As mentioned above, the colourful illustrations could be understood immediately, but where information was too technical, like the market prices for instance, in-depth explanations were given. As mentioned above, it is good practice to make ample time for communication.

To convince an illiterate community of the advantages and benefits to be obtained from the various technologies may be seen as being very difficult, if not impossible, to accomplish, but it proved to be worthwhile, and the best practice is to have a demonstration of the technologies. It was also seen as being conclusive that this community would need these technologies to address their needs and problems. The decision to use print-outs to explain and demonstrate the various information, was also seen as good practice, and it surely combated the technophobia which may hamper the adoption of information technologies (Beyers, 1996). As explained, it contained colourful sketches that could be easily understood by this illiterate, oral community. These print-outs were received with great enthusiasm as they were all agriculture related, which formed the basis of the needs of this rural agricultural community.

6.5 WORKSHOP SITUATION

The workshop situation proved the most successful means to establish participant communication. "The workshops are engaging communication, they are not simply a classroom situation where somebody is delivering to others ... a very interactive process – where the sharing aspect is stressed: skills are shared, experiences are shared, learning is shared and so the workshop is a very powerful forum for information exchange" (Leach, 1999:77). The workshop situation also created an atmosphere where the impressions of the Development Committee could be expressed and this information sharing and of building up

a relationship of trust was very important. This workshop situation was identified as the approach most conducive to information dissemination – where there is a group with a particular shared interest (to address their information needs), and the information exchange was quite rich. Information provision was largely a participative interactive process and the oral approach was dominant because it allowed for a two-way sharing process.

The atmosphere during the workshops was also very relaxed, due to the good sense of humor displayed by Mr Adendorff and to Dr Rutherfoord, the facilitator, who handled the workshops in a professional, though relaxed manner. When Mr Adendorff used the analogue to the wagon and oxen in order to explain where the telecentre would fit into their WUA, the members of the Development Committee were especially at ease, as this was an example from their every day lives with which they were familiar - an analogue which they could immediately understand as well as internalise.

The objectives of the workshop:

After two meetings with Mr Shaker, he agreed that the telecentre should be established once the consent of the Development Committee was obtained. The analysis of the practical implications was executed by the Researcher and the information needs of the community were identified and discussed with them during the demonstration. This detailed demonstration was also executed in order to explain to the Development Committee which ICTs could be offered by a telecentre, in order to address their needs. The long-term perspective will now also be achieved, namely the implementation of a telecentre, as the consent of the Development Committee was obtained after the demonstration.

Conclusion

In conclusion, it can be said that it is certainly possible to establish an effective telecentre in a rural, agricultural community, given of course that the consent of the community members can be obtained. This can only be achieved once the community realises where the telecentre could fit into their management. A survey of their needs should also be executed, in order to determine what information was needed for them to become self-sustainable. Although the needs assessment should be done in participation with the community, an extensive survey on the needs of the Development Committee was previously done by LVA. In order to remind the Development Committee of these aspects, the Researcher discussed these needs with the Development Committee before the demonstration. It is thus of the utmost importance to execute a needs assessment, in order to be able to identify what the specific needs are – if the

state of mind, approach, set of values, norms and ambitions etc. of the community are not development orientated, none of the existing development approaches will have anything other than incidental effect.

Telecentres can of course be dropped into the community as 'boxes from the sky', but such telecentres would definitely not be seen as sustainable. For this reason, an analysis of the practical needs was done in order to determine what the information needs were. From the pilot project, it was apparent that the members of the community would need the information that could be obtained from the ICTs for them to become selfsustainable. The sustainability and viability of this project was proved – mainly because the communication of the pilot project was participative and people driven.

ABBREVIATIONS

ACCE	African Council on Communication Education
AGIS	Agricultural Geographical Information System
ARC	Agricultural Research Council
CBO	Community-based organisation
CD-rom	Compact Disk - read only memory
CIC	Community Information Centre
COMTESCA	Communication for Technological Advancement
CSIR	Council for Scientific and Industrial Research
CV	Curriculum Vitae
DC	Development Communication
DSC	Development Support Communication
DWAF	Department of Water Affairs and Forestry
EU	European Union
FAO	Food and Agriculture Organisation
FES	Friedrich Ebert Foundation
GKD model	Global Knowledge for Development model
ICT	Information and Communication Technologies
IDRC	International Development Research Centre
IT	Information Technology
LVA	Loxton Venn Associates
MACIS	Mamelodi Communication and Information Services
MPCC	Multi Purpose Community Centre
NDA	National Department of Agriculture
NGO	Non-governmental Organisation
NPDALE	Northern Province Department of Agriculture, Land and Environment
NPFA	Needs, Problems, Fears and Aspirations
NTK	Northern Transvaal Co-operation
PC	Participant Communication
RASCOM	Regional African Satellite
SAAU	South African Agricultural Union
SAFEX	South African Futures Exchange

SATRA	South African Telecommunications Regulatory Agency
UK	United Kingdom
USA	United States of America
UNEP	United Nations Environmental Program
UNESCO	United Nations Educational Scientific and Cultural Organisation
USA	Universal Service Agency
VCR	Video Cassette Recorder
WGV	Watergebruikersvereniging
WRC	Water Research Council
WTO	World Trade Organisation
WUA	Water Users Association

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ABSTRACT

A pilot project for the development of guidelines for the establishment of a telecentre in a rural agricultural community in South Africa

by

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The aim of the research was to produce guidelines for the introduction of ICTs to a rural agricultural community in South Africa by means of a telecentre. There are no existing guidelines for the introduction of these communication tools to a rural agricultural community. The research is important as many of the existing telecentres failed due to the fact that no preproduction audience research was undertaken before these telecentres were established. This lack of a proper needs analysis is regarded as an important reason for the failure of most of these telecentres, as they were implemented as 'boxes from the sky' - the needs of the specific community were not identified, analysed or taken into consideration and were also not communicated to the specific community, in order to consider which technologies and what kind of information were needed by the community to become self-sustainable. The specific needs of the communities are not addressed by the current telecentre initiatives.

The research was conducted within the DSC paradigm, and the culture of the rural agricultural community of Thabina formed a central part of the preparatory, as well as the demonstration phases of the pilot project. The practical needs and culture of the agricultural community of Thabina were investigated and formed the basis of the pilot project. The information to be obtained from the technology was demonstrated and was based on the needs as determined by the research. The research itself was done by means of participant observation during interaction with the various stakeholders.

The result of the pilot project is that, due to the fact that the consent of the Development Committee at Thabina was obtained after a demonstration of the various ICTs, a telecentre will be established in due course. The practical needs expressed by the Development

Committee during a survey conducted by Loxton Venn Ass. (LVA), will also be addressed by means of the ICTs on which the telecentre will be based, in order for the community of Thabina to become self-sustainable. The agricultural community at Thabina will then have access to agriculture related information, e.g. irrigation, product prices, market information, etc. As a Water Users Association (WUA), they will also be able to communicate with other agriculture-related organisations such as the government departments, financial institutions, markets, co-operatives, other WUAs and research institutions.

Conclusions firstly comprise the fact that it became clear that the concept of a telecentre should be explained to the specific community before the project could commence. A thorough study of the needs of the community should also be undertaken, to determine which of the ICTs, should be used and what type of information that could be obtained from these technologies would address the specific needs of the community to be developed. It is also a good practice to introduce the various ICTs to the community by means of a demonstration, as ICT is a new and unknown concept to a rural community, with which it is totally unfamiliar. The importance of having based the project on the DSC paradigm, as well as the interaction with the role-players by means of participant observation, was evident throughout the research. The DSC paradigm forms the basis for the success of any research aimed at development.

EKSERP

'n Loodsprojek vir die ontwikkeling van riglyne vir die daarstelling van 'n telesentrum in 'n landelike landbougemeenskap in Suid-Afrika.

deur

Daisy van der Merwe

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Graad: Magister Artium

Die doel van die navorsing was om riglyne daar te stel vir die implementering van inligting- en kommunikasietegnologieë ("ICTs") in 'n landelike landbougemeenskap in Suid-Afika deur middel van 'n telesentrum ("telecentre"). Daar is tans geen riglyne vir die uitvoer van 'n behoeftebepaling vir die bekendstelling van hierdie kommunikasiemiddele in 'n landelike landbougemeenskap nie. Die navorsing is belangrik in die sin dat die meeste van die huidige telesentrums faal omdat geen navorsing vooraf van die gemeenskappe waar die telesentrums geïmplementeer word, onderneem word nie. Die mislukking van meeste van die huidige telesentrums kan toegeskryf word aan die feit dat hulle net daar geplaas is deur instansies: Die spesifieke behoeftes van die gemeenskap is nie geïdentifiseer, ontleed en in ag geneem ten einde vas te stel watter tegnologieë en watter soort inligting die gemeenskap benodig ten einde selfonderhoudend te word nie. Die spesifieke behoeftes van die gemeenskap is dus nie aangespreek in die huidige telesentrum-inisiatiewe nie.

Die navorsing is gedoen deur middel van die Ontwikkelings-ondersteunings-kommunikasiemodel ("DSC"), en is ook belangrik weens die feit dat die behoeftes en kultuur van die landbougemeenskap die sentrale deel van die voorbereidende ondersoek en die demonstrasiefase van die loodsprojek vorm. Die behoeftes en kultuur van die landbougemeenskap van Thabina was ook ondersoek en het die basis van die loodsprojek gevorm. Die informasie gedemonstreer, is gebaseer op die praktiese behoeftes soos vasgestel gedurende die navorsing gedoen deur Loxton Venn Ass. (LVA).

Die resultaat van die projek behels dat, weens die feit dat die goedkeuring van die Ontwikkelingskomittee van Thabina verkry is na 'n demonstrasie van die verskillende

tegnologieë wat 'n telesentrum kan bied, daar nou binnekort 'n telesentrum by Thabina opgerig gaan word. Die praktiese behoeftes, soos uiteengesit in 'n opname deur LVA, sal nou aangespreek word deur die ontwikkeling- en kommuniksietegnologieë ("ICTs") waarop die telesentrum gebaseer sal word, sodat die gemeenskap van Thabina tot 'n selfonderhoudende gemeenskap ontwikkel kan word: Die landbougemeenskap van Thabina sal nou toegang hê tot landbouverwante inligting soos besproeiing, produkpryse, markte, ens., en sal nou, as 'n Watergebruikersvereniging (WGV) kan kommunikeer met ander landbouverwante organisasies soos die Departement van Waterwese en Bosbou en die Waternavorsingskomissie, sowel as ander WGVs.

Gevolgtrekkings van die navorsing behels die feit dat dit duidelik geblyk het dat die konsep van 'n telesentrum eers aan die gemeenskap wat ontwikkel word, verduidelik moet word voordat die projek kan begin. 'n Deeglike studie van die behoeftes van dié spesifieke gemeenskap moet gedoen word, om sodoende te besluit watter inligting- en kommunikasietegnologieë, asook watter soort inligting daarvan verkry, die spesifieke behoeftes van die gemeenskap sal kan aanspreek. Demonstrasies word gebruik om die verskillende inligting- en kommunikasietegnologieë aan die gemeenskap bekend te stel, omdat dit vir 'n landelike gemeenskap 'n totale nuwe en onbekende konsep is. Die belangrikheid om deurgaans goeie kommunikasie en interaksie met die rolspelers te behou, is deurgaans deur die projek bewys. Om die projek op ontwikkelings-ondersteuningskommunikasie te baseer en interaksie tussen die rolspelers deur middel van deelnemende observasie te bevorder, het duidelik geblyk die grondslag vir die sukses van enige navorsing met ontwikkeling as doel, te wees.

SOME SOUTH AFRICAN EXPERIENCES (Conradie, 1998:108-111)

- **Serving the community in Siyabuswa - the SEIDET telecentre**

From the remote Siyabuswa district situated in the Mpumalanga Province comes an encouraging story of local initiative and vision that was crowned with success. The Siyabuswa Education Improvement and Development Trust (SEIDET) centre is a multi-purpose facility providing a variety of educational services and developmental programmes to the local community such as tuition programmes to the local community. These include supplementary educational tuition programmes for pupils and teachers, (especially in English, Science and Mathematics, career guidance and life skills enrichment programmes for the youth, finding university sponsorships and placement for local students, training in specific educational computer applications, and access to educational satellite TV transmissions.

There was a considerable level of pre-development activity when the centre was being planned - local residents reacted to identified educational needs in their community and formed various structures such as a Board of Trustees and Executive Committee to establish and run the centre. There was thus 'local pioneers with vision', and they set clear objectives of what had to be done. The centre managed to involve a number of other organisations in supporting roles, (e.g. the University of Pretoria, the Mpumalanga Department of Education, the Human Sciences Research Council and Vista University). It is clear that there had been a significant community response to participate and help. Especially over week-ends there are many forward-thinking local teachers and residents who offer their services as facilitators, teachers or trainers to the centre free of charge. To support and equip these individuals, there are a number of externally finances 'training-of-trainers' types of initiatives. There is thus abundant evidence of co-operation and collaboration among all parties involved. SEIDET provides a prime example of how to follow a 'community-centred management approach' at a centre by creating community ownership, by being accountable and transparent to community stakeholders, and by trying to be continually aware of the changing environment by initiating, monitoring and evaluation processes. The centre also managed to avoid the pitfalls, e.g. projects being

led by technology in stead of by a previously identified local development needs, using specific ICT's for inappropriate uses, or trying to do everything with technology.

- **Commercial planning with commercial success only - the Hammanskraal Phone Shop**

The Hammanskraal Phone Shop is a structure made out of reconstituted shipping containers, and it is housed at the entrance of the Leseding complex opposite the Hammanskraal police station in the North-West Province. Although it provides local residents with free access to a computer system offering detailed information on a variety of topics and areas, the centre's main focus is on a number of ICT-based services run on a commercial basis, most notably cellular telephone links with the outside world, as well as computer typing and printing facilities.

The following activities did in fact take place: With regard to commercially-orientated activities there was a fair amount of pre-development activity: It started when a local businessman saw the potential demand for cellular phone services, and he had the drive and vision to approach Vodacom - a local cellular phone service provider - with clear commercially orientated objectives. This led to the centre being erected. With regard to the community-oriented (non-commercial) services at the centre, there was no pre-development planning. However, Vodacom did bring in another institution in a supporting role, the CSIR, who installed a computer-based system that residents could use to access development-related information, and who also trained three facilitators at the centre to assist users. However, an HSRC evaluation of the system among users showed that the content of the information on offer was not seen as being very relevant for locals. It therefore seems as if the Hammanskraal centre is surviving financially because appropriate business-orientated measures were initiated and followed through in response to local communication needs. The community-orientated informational activities are not having a marked effect, seemingly because of unsuitable content, and this is to some extent indicative of a lack of local ownership and a lack of pre-installation planning.

- **Commercial failure but community success - the Brits Publicity Association**

Brits is a small town situated not far from the picturesque Hartebeespoort Dam about 50 kilometres to the west of Pretoria. In January 1997 the Brits Publicity Association established an information centre in the rates and taxes hall of the Brigs Transitional Local Council by installing a touch-screen information kiosk there. The kiosk uses the CSIR's self-help 'In-Touch' system that provides information to users in the form of text, graphics and sound that can be evoked by touching the screen.

The installation of the kiosk was preceded by extensive pre-development planning and negotiations. Two enthusiastic officials of the Brits Transitional Local Council had collected a large amount of data on local and development-related issues, and they had a vision of getting local business enterprises to advertise on the kiosk system, to such an extent that a profit could be made out of providing this free information to the public. HSRC evaluations of the system have shown that users like the system and the information it provides. In spite of this popularity among members of the local community, it unfortunately has transpired that local businesses are not interested in advertising on the system. Although the ICT is acceptable to the public, the technology appears to be alien to the advertisers, and this was not taken into account or made provision for during the planning. The information system is therefore successful as a community-orientated service, but it is unsuccessful in its primary goal, which is to be a profit-making commercially-orientated venture. Unless the advertisers' lack of support can be addressed, and remedied, the continued future of this centre remains uncertain.

- **Community-orientated planning and success - the Micha-Kgase educational telecentre**

The Micha-Kgasi High School is located near the remote Kgabalatsane village in the North West Province. Although there are no telephone lines in the area and there are no affluent local businesses that can sponsor educational initiatives, this school has managed to erect a telecentre that is equipped with donated computers (albeit somewhat outdated in most cases) and a modem using cellular technology to provide their Pentium PC with an e-mail link to the rest of the world. The centre is used for computer skills

development and for innovative educational projects involving the use of computers and e-mail.

The Micha-Kgasi telecentre can boast a number of points indicating success: The most noticeable point is the strong leadership and vision shown by the school principal, Mr Philemon Kotsokoane. Mostly through his efforts, there has been a great deal of pre-development planning regarding using ICT for educational purposes: clear goals have been set, and a number of influential local and international organisations, donors and institutions have been actively involved in the activities at the centre. The strongest point mitigating against continuing success is that the centre has not initiated any commercially-orientated ICT programmes or activities that could provide additional funding, and so the centre has remained dependent upon donations or grants from institutions such as funding organisations or educational bodies. However, in spite of this, within a year or two the school and its telecentre have moved out of virtual obscurity and have become well-known both locally and abroad.

DO'S AND DON'T'S WHEN USING THE FAX AND E-MAIL (van Lill, 2000)

Message

- Do not type in capital letters. In Internet language it means you are screaming.
- A line should contain a maximum of 70 characters. Some e-mail programs break off a line after a certain amount of characters. Your message may therefore arrive at its destination in a quite unusual format.
- Contemplate your e-mail message before you send it. Remember that it is permanent, can be easily intercepted and sent to other users.
- Keep your message short. Short sentences and paragraphs are not only easier to read, but some farmers have to connect to their service providers via farm lines. The longer the message, the longer it takes to deliver it on the e-mail. It may also cause the receiver to consider the message too long to wait for. The same applies to attachments.

Reply

- Do not send back the full e-mail message when you answer someone. Copy only the relevant parts, delete the rest so that the message can remain as short as possible.
- Write your comment at the beginning of the copied part of the message, so that the receiver can immediately read your answer, but will still be able to see the relevant original message. Sometimes days go by before e-mail gets answered and the other correspondent will not necessarily remember what was in the original message.
  An example of an e-mail message and the reaction on it is shown below:

  *Thanks, I am interested
  >I have a limited amount of onion seed available
- Do not forward personal e-mail to a discussion group without the permission of the original sender.
- Make sure that, when you answer an e-mail that was sent to a group, that you don't forward your answer to the entire group of 1000 receivers of the original message, but only to the sender. Use the "reply" button, The "reply to all" button will make you

very unpopular.

- Set your e-mail program to add a *short* signature (not more than four lines) to the bottom of messages. Keep it short: name, title, contact number, work address or name of farm etc., usually in a smaller font.
- Do not use e-mail discussion lists for commercial purposes. Bill Gates will not pay $1000 for a list of addresses and Disney World will not make a free holiday available. Finally, viruses are picked up by good anti-virus software and not by "anti-virus warnings or chain letters".
- Do not forward chain letters

Where do I start in using the Internet?

It is important to know that the Internet does not have a front door. There is not only one place where you can start discovering the Internet. If you know on what subject you want information, or know what you want to do, you use a search engine to get there. Search engines can be described as electronic indexes of what is available on the Net.

If the Internet would be a book, the search engine would have been the index. By entering certain keywords or phrases, the search engine sifts in these pages (from all the possible web pages on the Internet) that is applicable to your keyword or phrase. There are quite a number of search engines on the Internet. You can choose on which one you want to search for your information.

Handy hints

As with any communication, the Internet also has its own codes obtaining specific and relevant information. The following aspects should be born in mind when using the Internet:

- Use keywords in your search that are as specific as possible. If for instance you are looking for a remedy for ear pain, just type in "ear pain", and also try to type in as much information as possible about it.

- Use an asterix (*) if you are not sure what the rest of a word is. If you should type in the word big*, the computer will search all the possibilities that begins with big, e.g. bigger, biggest, bigwig, etc.

- Use inverted commas to indicate phrases as one concept. If you should type in ear pain, the search engine will search for web pages that contain all three words, e.g. 'ear' and 'pain'. This will have the effect that you receive such a lot of results that it would be impossible to work through.
- If however, you place the words in inverted commas, e.g. "ear pain" the search engine will search for it as one phrase and you will only receive information on these three words.
- You can also include or exclude words by using the + or - sign. In this way you can look for chocolate cake recipes without chocolate chips by typing in as follows: recipe +chocolate -chips. The computer will now search on the web pages for the words recipe and chocolate and exclude those that have chips in.

SAFEX - Trade Prices

Contract	ExpiryMonth	ExpiryYear	Future/ Option	Option Type	Price	Volatility	Premium	Volume	Time Last
ALSI	JUN	2000	Future		7401			10	6/12/00 3:4
ALSI	SEP	2000	Future		7590			10	6/12/00 2:2
ALSI	MAR	2001	Future		7910			100	6/12/00 3:4
ALSI	MAR	2002	Future		8170			50	5/10/00 5:1
FINI	JUN	2000	Future		3516			30	5/18/00 10:(
INDI	JUN	2000	Future		8676			60	6/12/00 3:4
INDI	SEP	2000	Future		8920			10	6/12/00 1:5
INDI	MAR	2001	Future		9230			60	6/8/00 11:2
JBAR	JUN	2000	Future		89.68			50	4/18/00 9:0
R153	AUG	2000	Future		14.96			7	5/19/00 4:3
SOLQ	JUN	2000	Future		58.28			10	6/9/00 11:1
SUNS	JUL	2000	Future		1125			10	6/1/00 11:2
SUNS	JUL	2000	Future		1100			3	6/9/00 10:2
SUNS	SEP	2000	Future		1174.5			1	6/1/00 11:3
SUNS	SEP	2000	Future		1151			1	6/9/00 11:5
SUNS	DEC	2000	Future		1234			3	5/31/00 9:2
SUNS	JUL	2001	Future		1230			1	6/8/00 11:3
WEAT	JUL	2000	Future		1320			10	6/8/00 11:3
WEAT	SEP	2000	Future		1230			1	6/9/00 11:3
VEAT	DEC	2000	Future		1216			2	6/6/00 10:3
VMAZ	JUN	2000	Future		609			2	6/12/00 11:
WMAZ	JUL	2000	Future		605			12	6/12/00 11:
WMAZ	SEP	2000	Future		623			5	6/12/00 11:
WMAZ	DEC	2000	Future		663			1	6/12/00 11:
WMAZ	MAR	2001	Future		698.4			1	6/9/00 11:5
WMAZ	MAY	2001	Future		676			2	6/8/00 11:0
WMAZ	JUL	2001	Future		700			1	6/9/00 11:5
YMAZ	JUN	2000	Future		628			2	6/9/00 11:5
YMAZ	JUL	2000	Future		623			1	6/12/00 11:
YMAZ	SEP	2000	Future		640			5	6/12/00 11:
YMAZ	DEC	2000	Future		682.6			4	6/9/00 11:5
YMAZ	MAR	2001	Future		730			3	6/1/00 10:3

YMAZ	MAY	2001	Future					2	5/10/00 11:4
YMAZ	JUL	2001	Future		700			1	6/9/00 11:1
ALSI	JUN	2000	Option	D		29.59%		200	5/24/00 10:(
ALSI	JUN	2000	Option	D		28.00%		100	6/12/00 10:4
ALSI	JUN	2000	Option	N			1858	30	6/8/00 1:53:
ALSI	DEC	2000	Option	D		25.72%		300	6/8/00 1:54:
ALSI	MAR	2001	Option	D		27.00%		100	6/8/00 4:42:
ALSI	MAR	2001	Option	D		34.00%		10	5/2/00 12:4(
ALSI	MAR	2001	Option	N			1200	10	5/4/00 11:1
INDI	JUN	2000	Option	D		39.00%		100	6/9/00 5:24:
INDI	JUN	2000	Option	D		39.00%		10	5/24/00 4:0(
INDI	JUN	2000	Option	N			450	20	5/22/00 9:1
INDI	JUN	2000	Option	N			629	10	6/2/00 11:2
INDI	SEP	2000	Option	D		31.00%		20	6/8/00 12:1
INDI	SEP	2000	Option	N			2017	100	6/7/00 11:3
INDI	MAR	2001	Option	D		28.00%		100	4/5/00 4:25:
INDI	MAR	2001	Option	D		33.52%		300	6/5/00 2:38:
SUNS	SEP	2000	Option	N			700	1	6/9/00 9:05:
SUNS	SEP	2000	Option	N			73000	1	5/26/00 10:2
SUNS	DEC	2000	Option	N			250000	5	5/25/00 11:4
SUNS	DEC	2000	Option	N			270000	5	5/25/00 11:4
SUNS	DEC	2000	Option	N			500	2	6/5/00 9:27:
WEAT	DEC	2000	Option	N			125000	1	6/7/00 11:3
WEAT	DEC	2000	Option	N			180000	10	6/2/00 9:55:
WMAZ	JUL	2000	Option	N			280000	5	6/12/00 11:5
WMAZ	JUL	2000	Option	N			60000	5	6/12/00 11:5
WMAZ	SEP	2000	Option	N			160000	10	6/6/00 11:4
WMAZ	SEP	2000	Option	N			200000	10	6/12/00 11:(
WMAZ	DEC	2000	Option	N			280000	10	6/12/00 11:2
WMAZ	DEC	2000	Option	N			470000	5	6/12/00 11:(
WMAZ	MAR	2001	Option	N			240000	10	6/6/00 11:0
WMAZ	MAR	2001	Option	N			480000	10	6/6/00 10:3
WMAZ	JUL	2001	Option	N			30000	5	6/8/00 9:15:
WMAZ	JUL	2001	Option	N			250000	5	6/2/00 10:2
YMAZ	JUL	2000	Option	N			180000	2	6/7/00 11:5
YMAZ	JUL	2000	Option	N			105000	2	5/3/00 11:3(

YMAZ	SEP	2000	Option	N			180000	10	6/5/00 9:58:
YMAZ	SEP	2000	Option	N			215000	5	6/12/00 11:(
YMAZ	DEC	2000	Option	N			400000	5	6/12/00 11:(
YMAZ	DEC	2000	Option	N			280000	5	5/18/00 11:5
YMAZ	JUL	2001	Option	N			160000	20	6/8/00 11:0(

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FUNGI DISEASES

COMMON NAME	SCIENTIFIC NAME	PHOTOGRAPH
Black Dot	*Colletotrichum coccodes*	
Early Blight	*Alternaria solani*	
Gray Mold (Botrytis)	*Botrytis cinerea*	
Late Blight	*Phytophthora infestans*	
Powdery Scab	*Spongospora subterranea*	
Silver Scurf	*Helminthosporium solani*	
Stem Canker/Black Scurf	*Rhizoctonia solani*	
Stem Rot	*Sclerotium rolfsii*	
Verticillium Wilt	*Verticillium albo-atrum & V. dahliae*	
White Mold	*Sclerotinia sclerotiorum*	
Fusarium Wilt	*Fusarium oxysporum & F.solani*	
Fusarium Dry Rot	*Fusarium oxysporum & F. solani*	
Gangrene	*Phoma exigue* var. *foveata* & *P. exigue* var. *exigue*	

Move cursor over Common Name

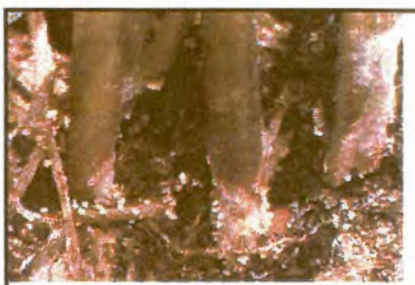
STEM ROT

(Sclerotium rolfsii)

Symptoms | Optimal Conditions | Other Hosts | Control

Stem rot attacks a wide range of plants, but is normally a problem under hot, moist conditions. The disease is caused by the fungus *Sclerotium rolfsii*.

DISEASE SYMPTOMS



Infection of stems take place at or just below the soil surface. The lower leaves become chlorotic and wilting of the whole plant takes place. A white, fanlike mycelium grows on the stem, tubers, or soil surface.

Numerous round, initially white, but later brown, sclerotia form at the stem base and soil surface. Plants wilt and lower leaves become chlorotic. Lesions usually grow up and down the stem and all living tissues are killed. Initially infected tissues are soft and brownish.

Tubers may become infected through the stolons of diseased material or through lenticels from mycelia growing over the tuber surface.

^

OPTIMAL CONDITIONS FOR DISEASE

The disease favor high temperatures (28 to 30°C). The fungus is soilborne and sclerotia can survive for years in the soil. Infection can occur at any stage during the growth of the plant. The disease spread mainly through mycelial fragments and sclerotia in debris or infested soil.

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FUNGAL DISEASES

Alternaria Leaf Spot	*Alternaria alternata*	
	Alternaria helianthi	
	Alternaria helianthicola	
	Alternaria helianthinficiens	
	Alternaria protenta	
	Alternaria zinniae	
	Alternaria tenuissima	
Black Stem (Late Lodging)	*Phoma macdonaldi*	
	P. oleracea var. *helianthi-tuberosi*	
Charcoal Rot	*Macrophomina phaseolina*	
Downy Mildew	*Plasmopara helianthi*	
	Plasmopara halstedii	
Grey Headspot	*Albugo tragopogonis*	
Grey Stemspot (Early Lodging)	*Albugo tragopogonis*	
Head Rot	*Rhizopus microsporus*	
	Rhizopus spp.	
	Botrytis cinerea	
Phomopsis Stem Canker ***	*Phomopsis helianthi*	
	Diaporthe helianthi	
Rust	*Puccinia helianthi*	
Sclerotinia Head Rot	*Sclerotinia sclerotiorum*	
Sclerotinia Stem Rot	*Sclerotinia sclerotiorum*	
	Sclerotinia minor	
Sclerotium Stem Rot	*Sclerotium rolfsii*	
Septoria Leaf Spot	*Septoria helianthi*	
Verticillium Wilt	*Verticillium dahliae*	
	Verticillium albo-atrum	
White Blister Rust	*Albugo tragopogonis*	

*** This disease has not been recorded in South Africa

^

The role of ARC-ILI in water conservation and small-scale irrigation development

The ARC-Institute for Agricultural Engineering (ARC-ILI), together with other ARC-institutes and partners, has been involved with the upgrading and maintenance of the infrastructure of various irrigation schemes in the Northern Province. This entails water distribution networks such as canals and pipelines. The ARC-ILI also investigates soil conservation projects such as flood water run-offs, storm water canals and the need to erect soil conservation structures. The Institute also does natural resource potential studies - this includes the availability of water and water quality potential of soil for irrigation purposes and the climate - quantity of rain and temperatures - to determine the types of suitable crops as well as crop water requirements. In-field irrigation training is also done. The mechanisation requirements of the schemes are also studied - how many ploughs, tractors and other cultivation implements are required for each situation.

An important function performed at these schemes by the Institute is the compilation of an infrastructure Development Plan. More important is that it is compiled in collaboration with the communities and their farmers. The ARC-ILI also compiles a water management plan for each irrigation scheme and provides training in water conservation and management to farmers. Pilot distribution schemes are established to serve as demonstration. This is part of a participative process, done in collaboration with Loxton, Venn Ass. (LVA). LVA is responsible for institutional capacity building and training.

Schemes currently involved are the following:

Thabina, near Tzaneen

Thabina has 200 ha under flood irrigation, involving 124 farmers. They grow maize during the summer and various types of vegetables during winter. Some of their maize is marketed and some sold locally.

Morgan, near Thohoyandou
The farmers here also cultivate maize, and sub-tropical fruit such as mangoes and bananas on smaller scale. About 50 ha is under irrigation and 24 farmers are involved.

Boschkloof, near Steelpoort, Lydenburg district
Vegetables are grown here during winter and maize during summer. At least 100 farmers on 180 ha are involved in this scheme.

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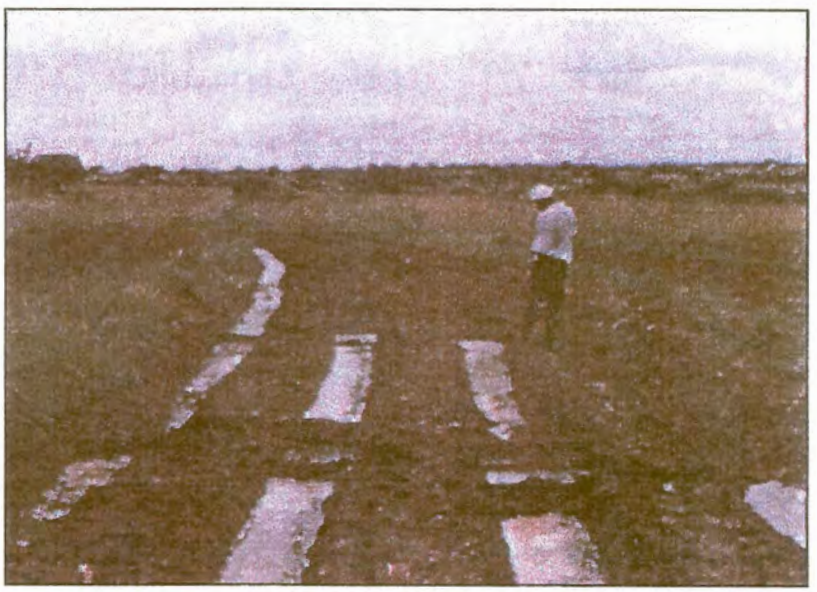
Dingleydale/New Forest, near Buschbuckridge
There are 650 farmers in this district growing maize and vegetables (especially tomatoes) during summer and winter, on 1 650 ha. This scheme significantly contributes to the local economy by providing jobs and supplying vegetables.



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***** This is the ARC Test Site *****

ARC-ILI investigates minimum tillage - Sustainable utilisation

Minimum tillage comprises all tillage practices that minimise the disturbance of the soil.

It is beneficial to certain types of soil to use tillage practices that are least disturbing, as it will improve the soil structure, or give the soil structure the opportunity to recover, because the soil is not tilled intensively. This practice is ideal for soil with a high clay content, as found in the Winterton district in Natal.

Tests are currently done at Winterton with the Brazilian minimum till planter. These tests examine how the planter handles the plant residue from the previous harvest (the new crop is planted in the crop residue of the previous season).

Minimum tillage has the benefit that it excludes intensive soil preparation and saves costs. It also retains the topsoil, which restricts water erosion and wind erosion. It preserves moisture in the soil and thus keeps the soil cool. Time is also saved because the farmer can plant directly after harvesting. A disadvantage is that the lower soil temperatures can restrain germination. Better weed-control is necessary because weeds are not worked into the soil by intensive tillage.

Whether to practice minimum tillage or not is a consideration that must be made by the farmer himself. But this is a method of tillage that surely has its advantages.

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AGEKON AKADEMIE, BK

Pers / Press

Tuis/Home

Register van Suid-Afrikaanse landboupers
Register of South African agricultural press

Naam *Name*	Kontak *Contact*	Telefoon *Telephone*	Faks *Fax*	E-pos *E-mail*	Tuis *Web*
Agricultural News	Magda du Toit	(012) 3196623	(012) 3232516	-	http://www.
Die Beeld	Retha Fourie	(012) 3252878	(012) 3215232	rfourie@beeld.com	http://www.b
Die Boer	August du Preez	(012) 3226980	(012) 3200557	salu@iafrica.com	http://www.a
The Citizen	Koos Liebenberg	(012) 3275106	(012) 3275503	-	
The Dairy Mail	Hennie Basson	(012) 8044800	(012) 8044811	mpo@cis.co.za	
Farmer's Weekly	Corrie Venter	(031) 4508261	(031) 4508200	fweekly@iafrica.com	
Finansies & Tegniek	Johann van Zyl	(011) 8847676	(011) 8840851	-	
Forum	Dr Eddie Webb	(012) 420 3271	(012) 420 3290	ecwebb@scientia.up.ac.za	
Kwana	Hilda Grobler	732 745-1292	732 745-9794	mesab@mesab.org	http://ww.
Landbou-weekblad	Chris Jooste	(051) 4047763	(051) 4489192	cjooste@volksblad.com	
Mediakomm	Willie Louw	(018) 2930622	(018) 2944221	mediacom@lantic.co.za	http://www.agrite
MGKaner	Jennifer Roets	(012) 3812855	(012) 2521669	magaliesberg@icon.co.za	
Natal Mercury	RH Frean	(0331) 425802	(0331) 428094	-	
Nufarmer	Johan Swiegers	(012) 8041469	(012) 8041469	-	
Ons Eie	Adri Theron	(053) 8311578	(053) 8312370	adrit@admin.suidwes.co.za	http://www.s
Plant Protection News	Karina Grove	(012) 8080952	(012) 8081489	nipbkg@plant1.agric.za	http://www
Potch Herald	Hennie Stander	(018) 2930750	(018) 2943916	Pherald@iafrica.com	
Punt Geselsradio	Andries Cornelissen	(011) 6555020	(011) 3159720	nuus@punt.co.za	http://www
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Radio Pretoria	Willem Thomson	(012) 5430120	(012) 5671457	-	-
Radio Oranje	André Grobler	(051) 5050923	(051) 5050922	andre@ofm.co.za	http://www
Sake-Rapport	Adri Senekal	(011) 4066644	(011) 4026906	sgous@rapport.co.za	-
SAMeat/Vleis	Willemien von Solms	(012) 6641168	(012) 6641168	-	-
Streeknuus	Marietjie Gerber	(05391) 71856	(05391) 71856	-	-
Taurus Nuus	Joël Kotze	(012) 6671122	(012) 6671827	prom@taurus.co.za	http://www.
Vrystaat Koerant	Lynda Greyling	(058) 3035411	(058) 3035106	perskor@dorea.co.za	-
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PRODUCT RANGE

Vegetable Seed

STARKE AYRES (PTY) LTD offers an extensive range of high quality, performance tested F1 hybrid and selected open-pollinated varieties of the following vegetable crops:

Vegetable Seed Product List

A comprehensive crop/variety list is available on request.

Many of the open-pollinated varieties offered are produced by the Company's own, fully equipped Production Department, and may therefore be offered at extremely competitive prices on the international market.

With the exception of the Company's own propriety tomato and pumpkin F1 hybrids, the F1 hybrid range is marketed under license on an exclusive basis for a number of leading seed companies world wide. Marketing rights are in place for all countries comprising the South African customs union as well as for certain other countries in Africa and the world, subject to ...

Recently, **STARKE AYRES (PTY) LTD** released its first own proprietary tomato and pumpkin F1 Hybrids. Bred and developed under local growing conditions, these varieties have performed extremely well under widely varying conditions and are rapidly establishing themselves in the market. Widely adaptable with superior disease resistant and growth characteristics, these varieties are recommended with confidence in all areas with similar potential and growing conditions.

SOUTH AFRICAN GRAIN CROPS

Market and price reports

Agrimark Trends
P O Box 30487
Wonderboompoort, 0033
Tel: +27(0)12 335-1076
Fax: +27(0)12 335-2737
E-mail:
amt@agrimark.co.za
Website address:
www.agrimark.co.za

by Agrimark Trends! (www.agrimark.co.za)

Contact persons

Francis Jurgens / Pieter van Wyk / Minda Bornman

Updated market and price information and analysis on the livestock industries for subscribers and general use

- Maize — Maize prices went downwards in the last weeks but the upward movement on Chicago Board of Trade and the weakening of the Rand pulled prices higher
- Sorghum — Sorghum prices followed maize prices to a great extent
- Wheat — Wheat prices are high currently, with planting time just around the corner
- SAFEX prices — SAFEX prices of maize are volatile in the last two days as a result of rain in South Africa, the exchange rate and the situation in the US
- Grain marketing
  - **Marketing Strategy / *Bemarkingstrategie***
- Trade agreements
  - **Zimbabwe Agricultural Commodity Exchange**

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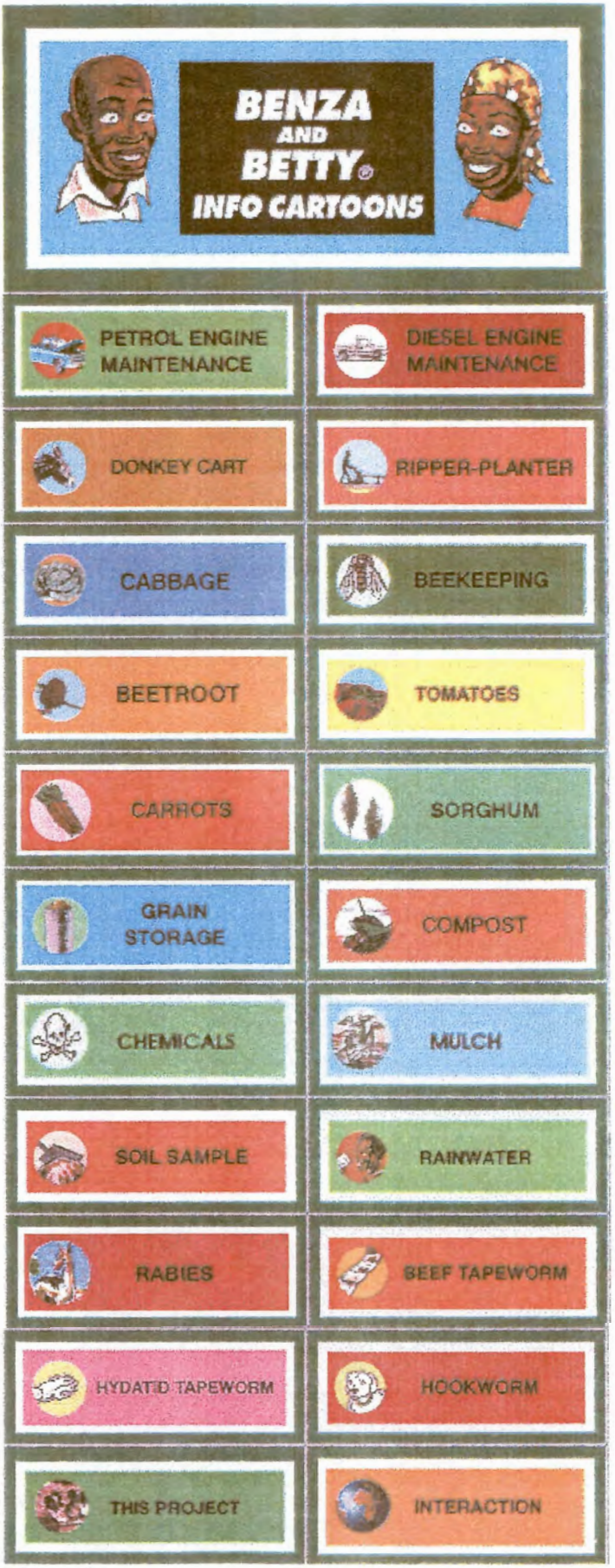
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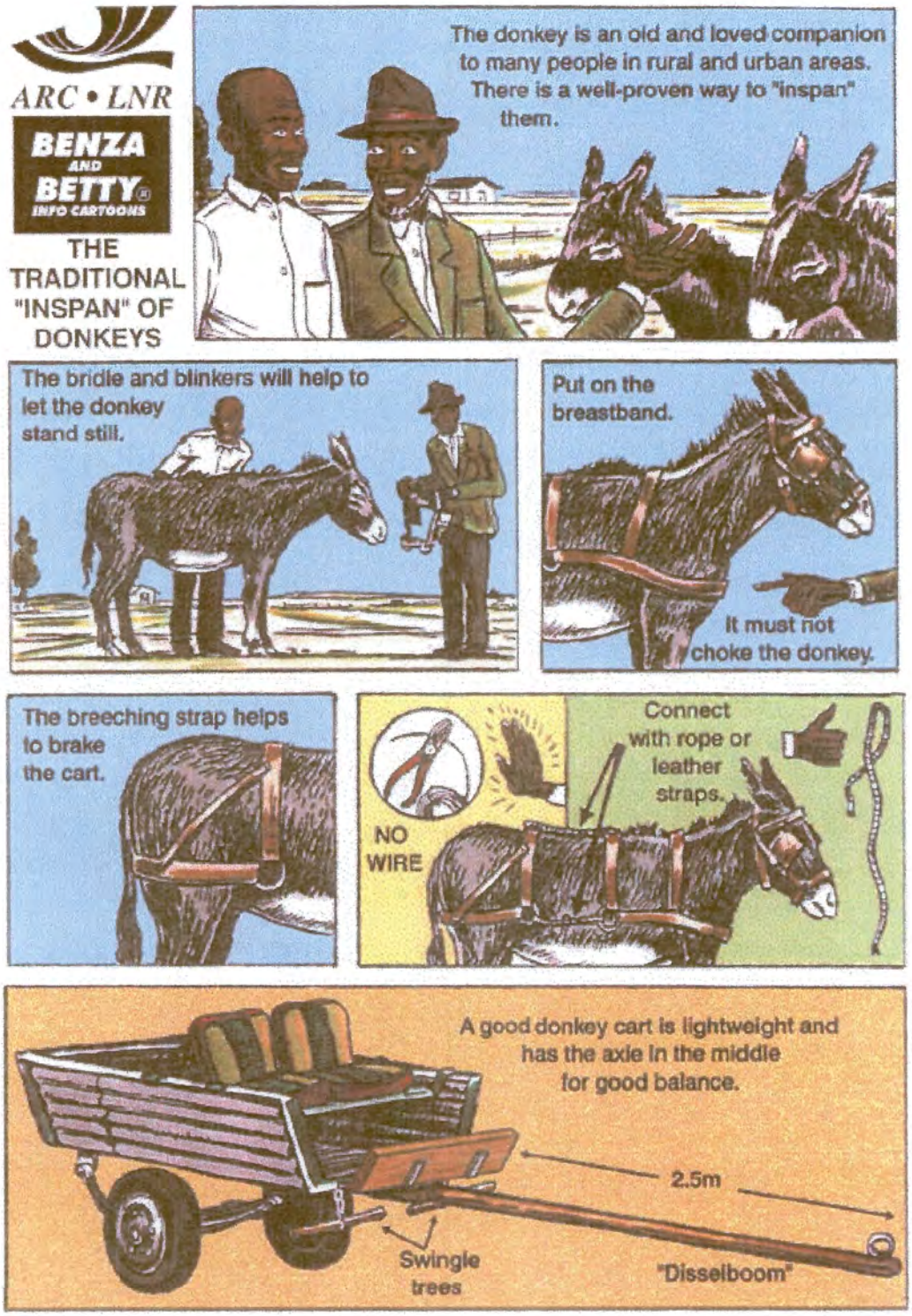

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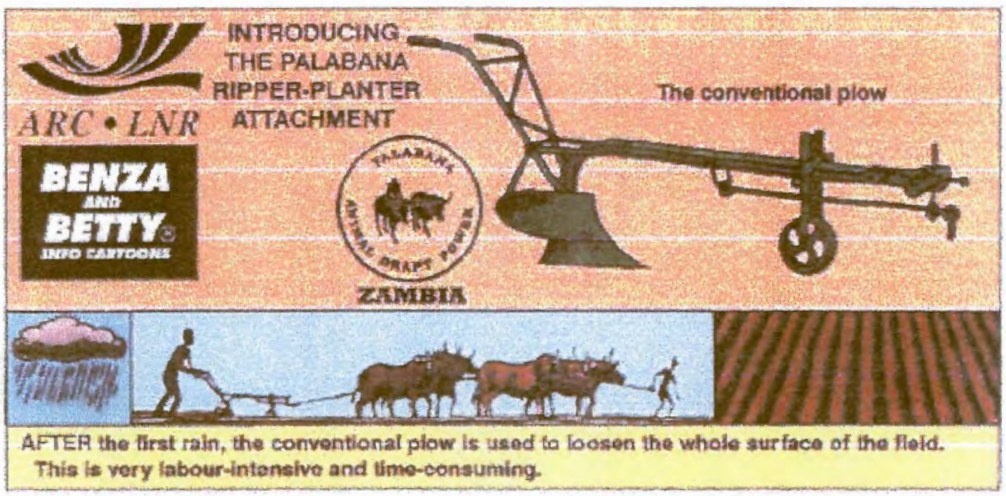

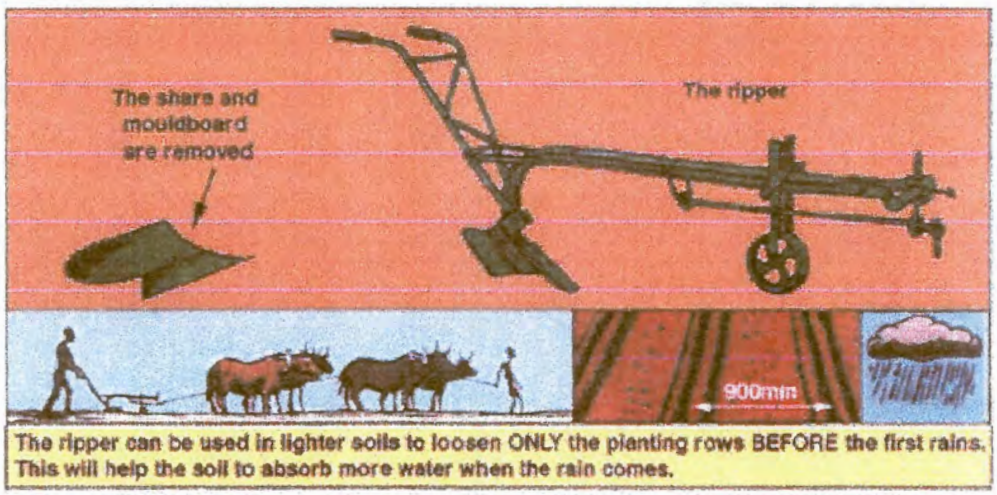

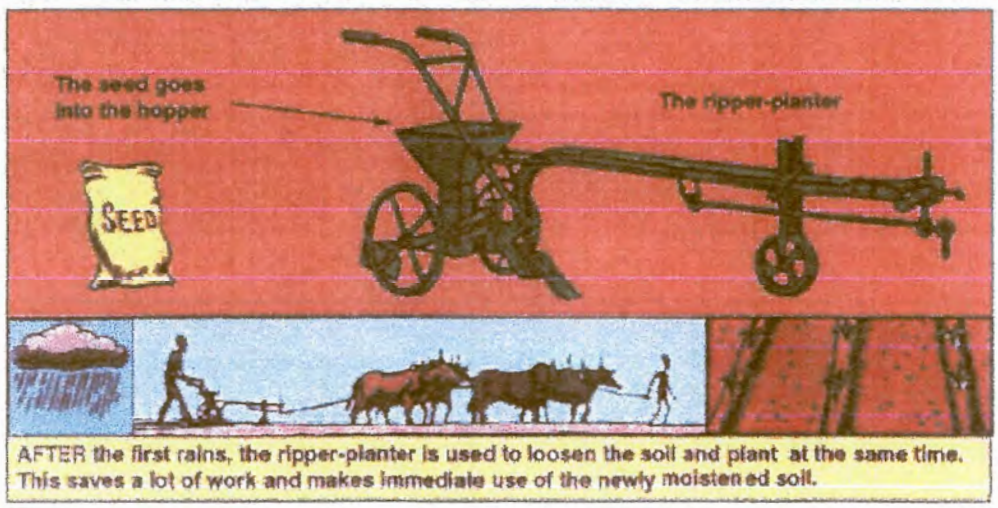

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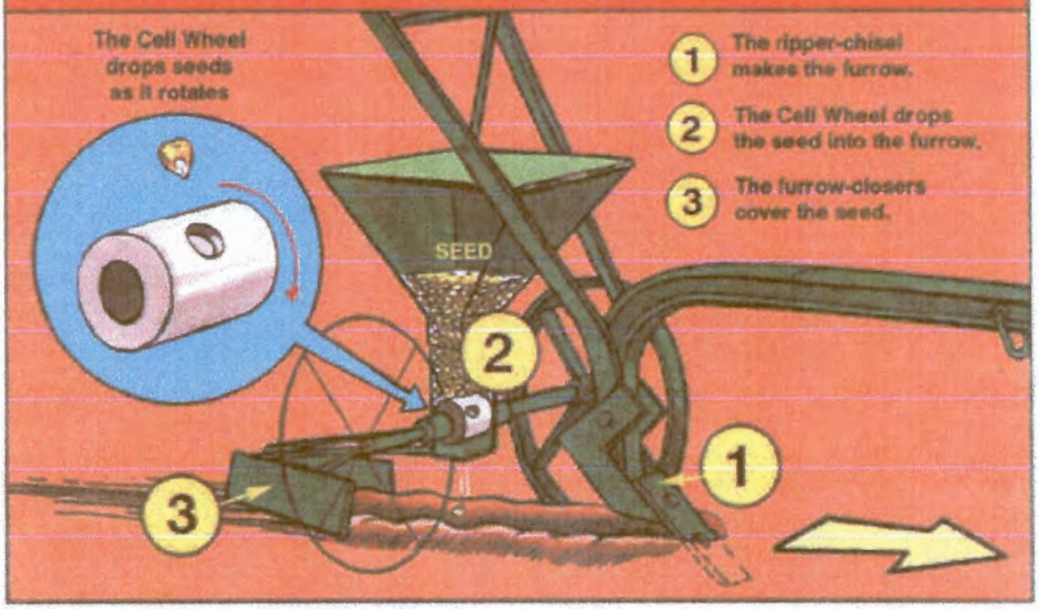

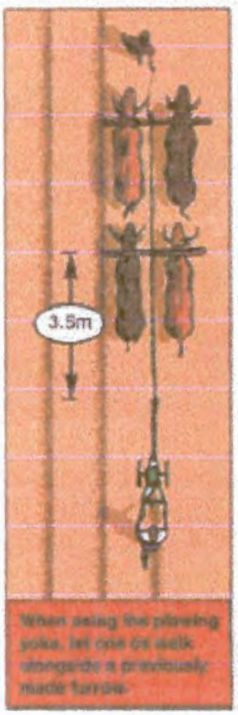

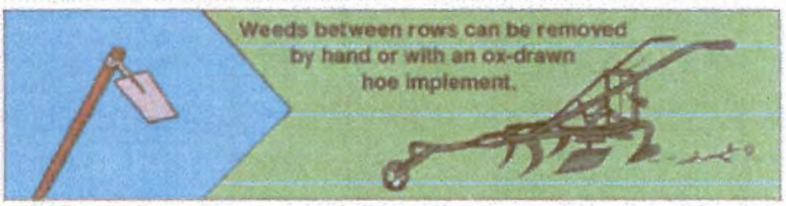

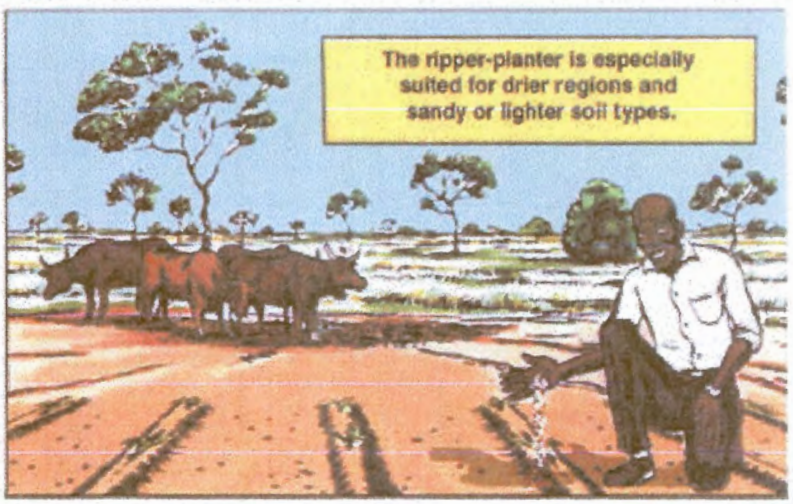

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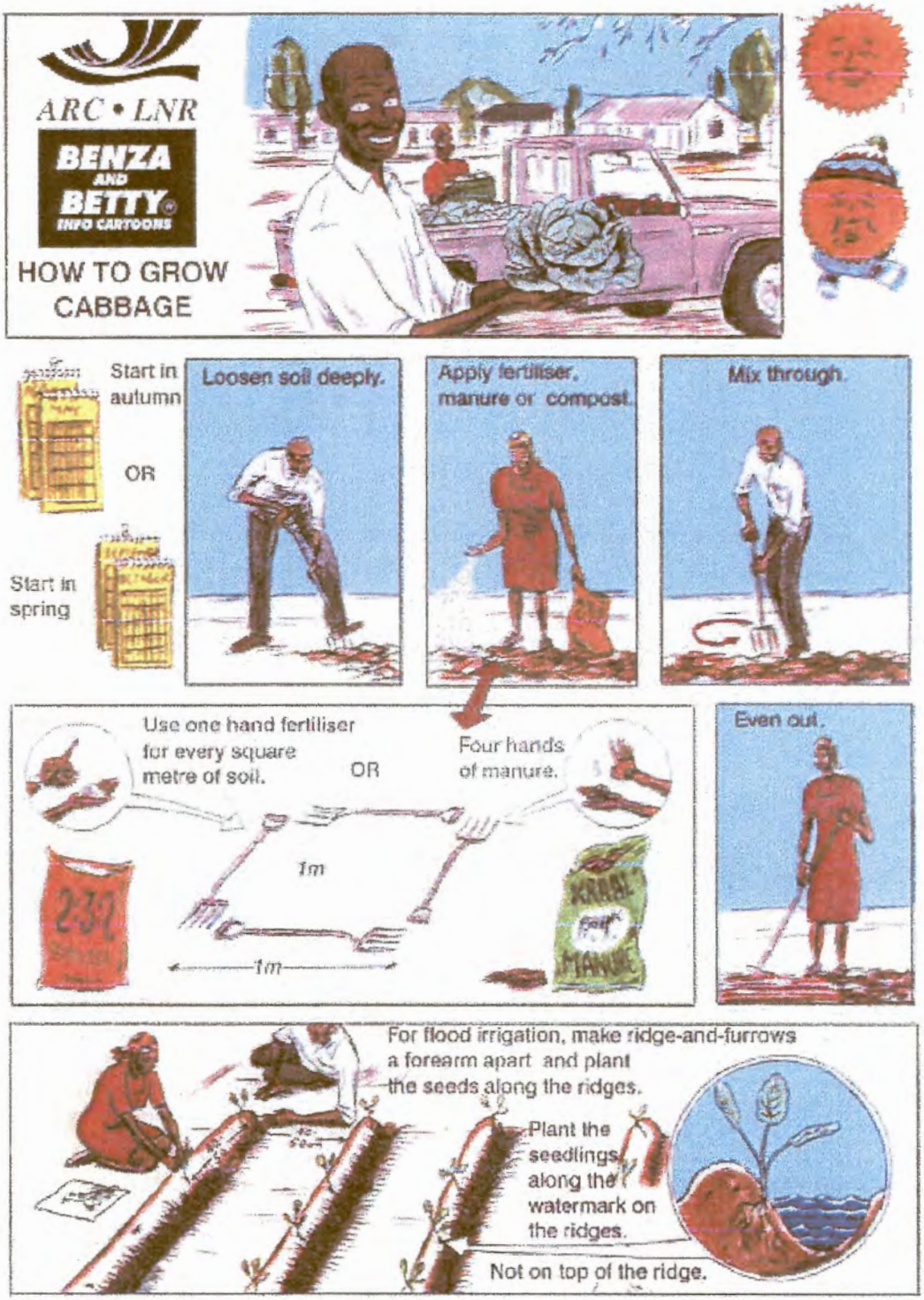
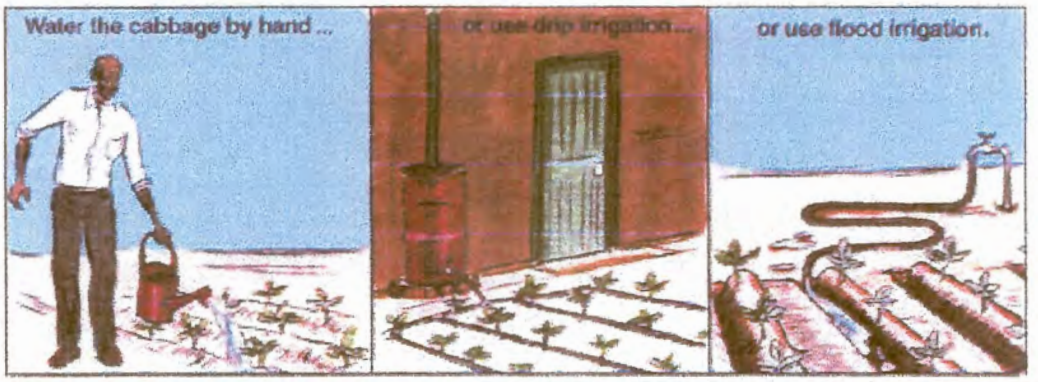
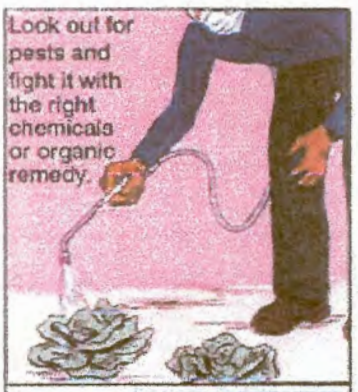




One month after planting.



4 Months after planting.

Catterpillars of diamond back moth | Aphids | Bagrada bugs

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HOW TO GROW BEETROOT
Start in spring
Loosen soil.
Add fertiliser.
Mix through.
Apply one hand of 2:3:4 for every square meter of soil.
2:3:4
1m²
1m
KRAAL MANURE
Organic fertilizer could cause deformed beetroot.
Even out.
Leave seeds in water overnight
Sow in a seedbed and water regularly.
Plant out seedlings when they are thumb height.


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INFO CARTOONS
HOW TO GROW TOMATOES
Tomatoes grow best in summer.
SEPTEMBER
Start preparing in spring
Loosen soil deeply.
Sprinkle fertiliser, manure or compost.
Mix it through.
Use one hand fertiliser for every square metre of soil.
OR
four hands of manure.
1 m²
1 m
2:3:2
FERTILIZER
KRAAL MANURE
Even out.
Make ridge-and-furrows (one forklength apart). Plant the seedlings along the ridges.
1m
Plant the seedlings a forearm apart in the rows.
Plant on the waterline in stead of on the ridges.

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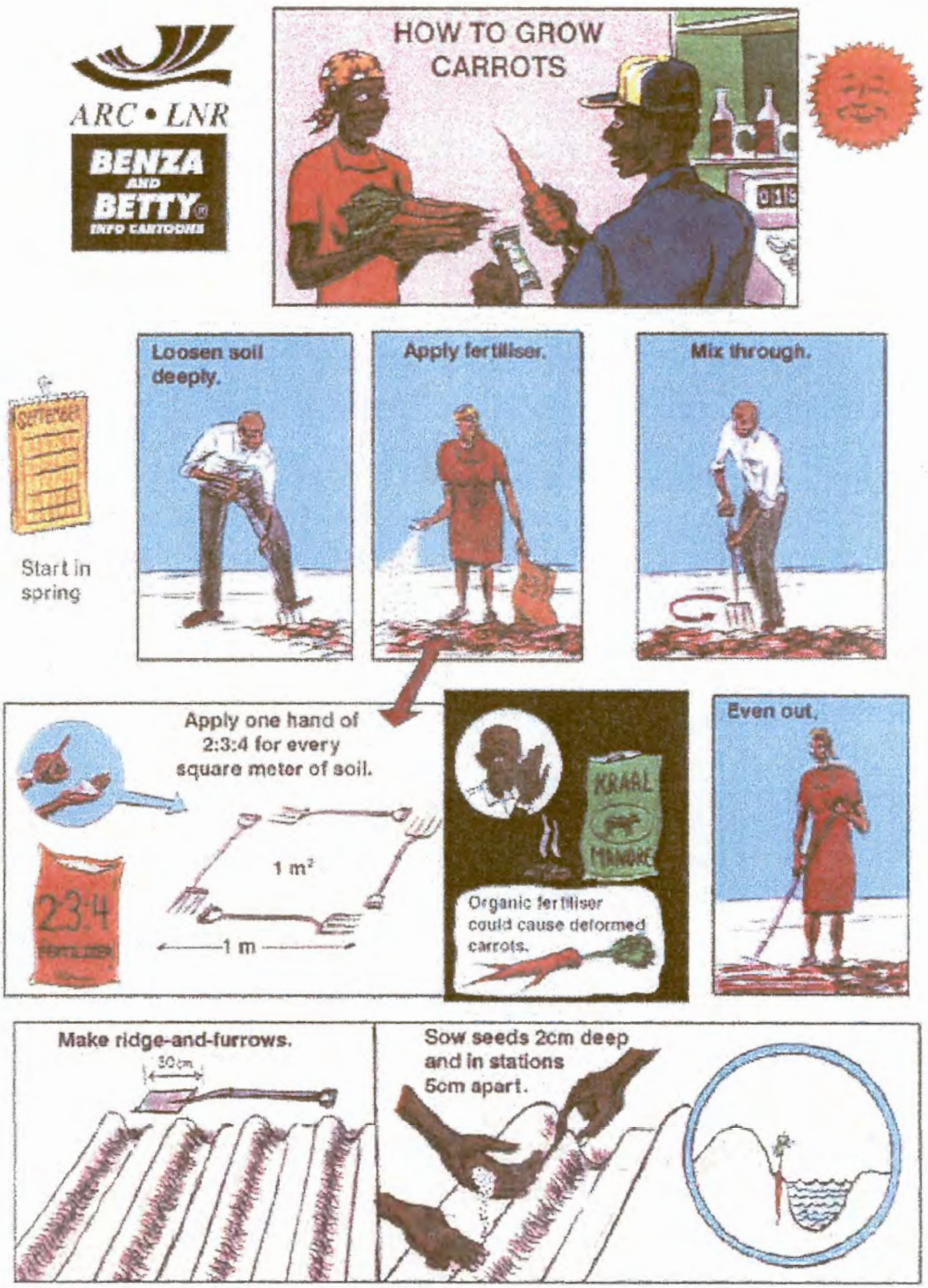

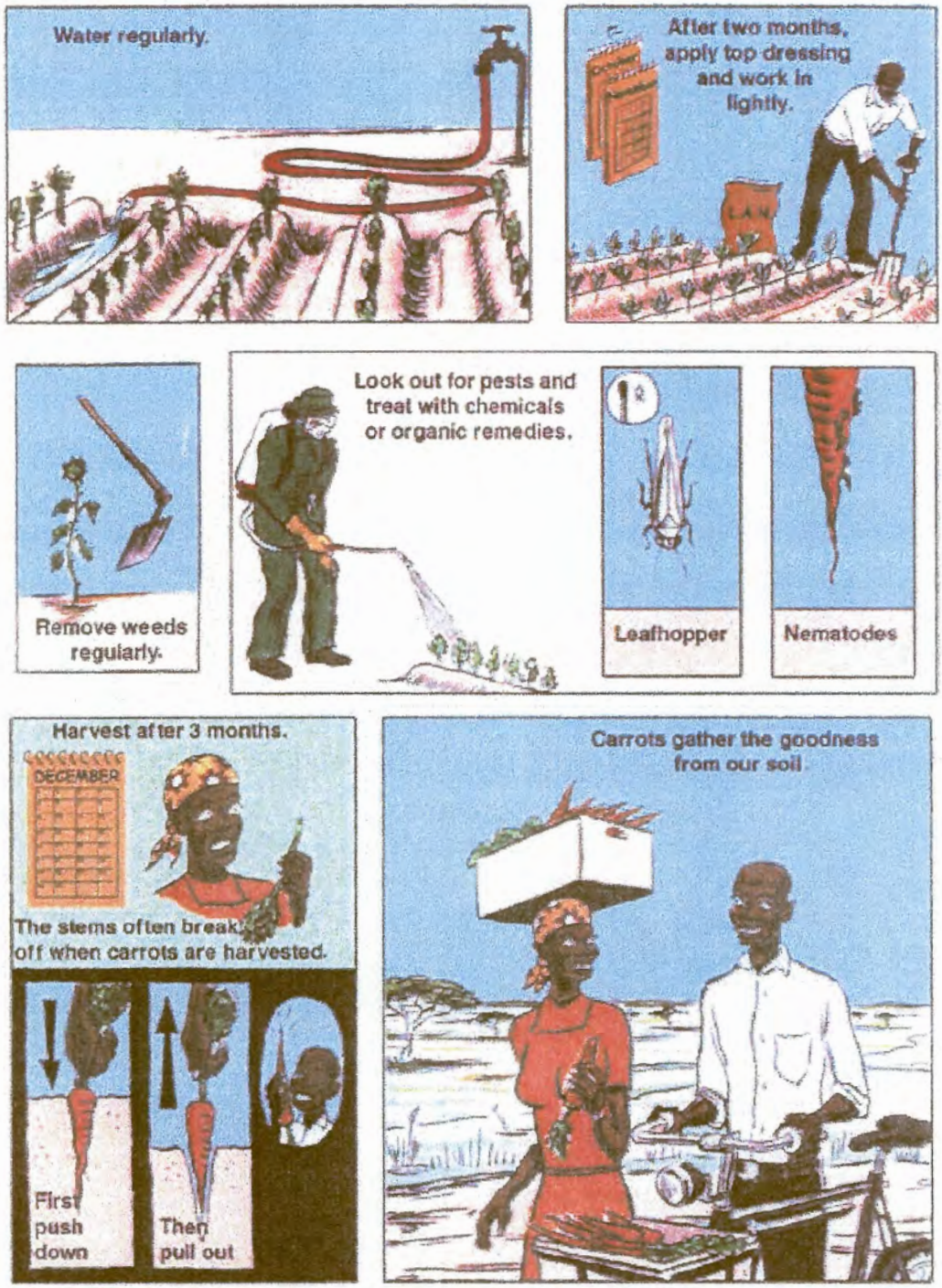

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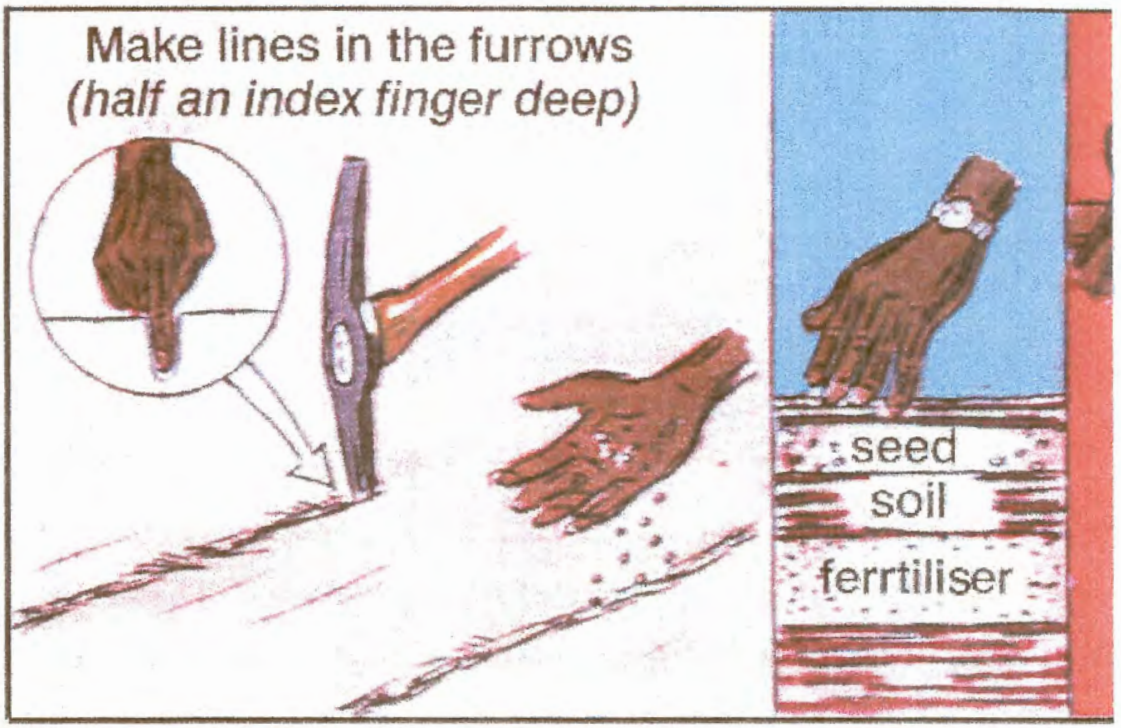

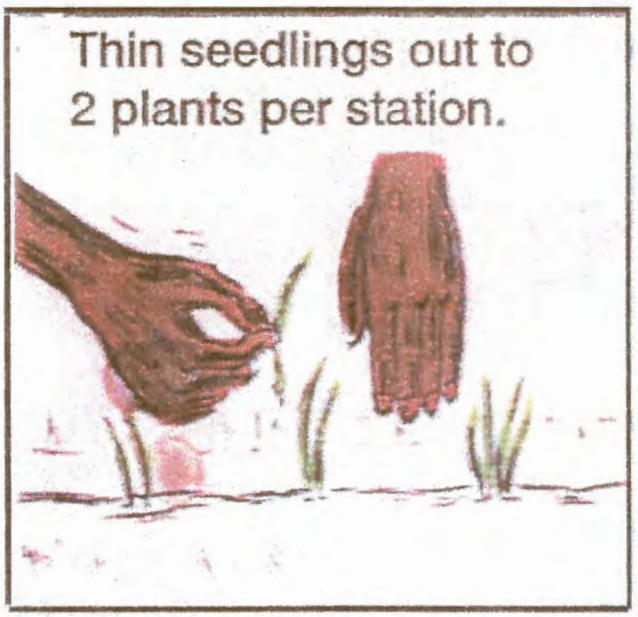

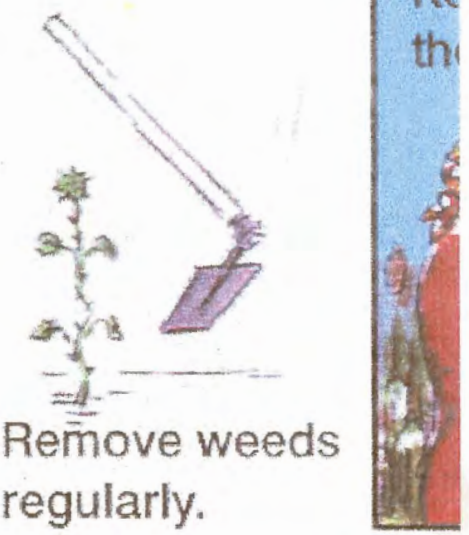

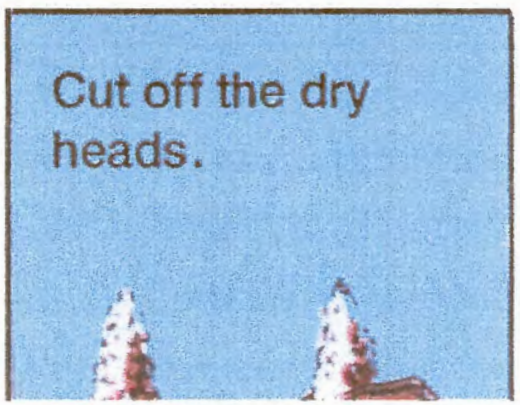

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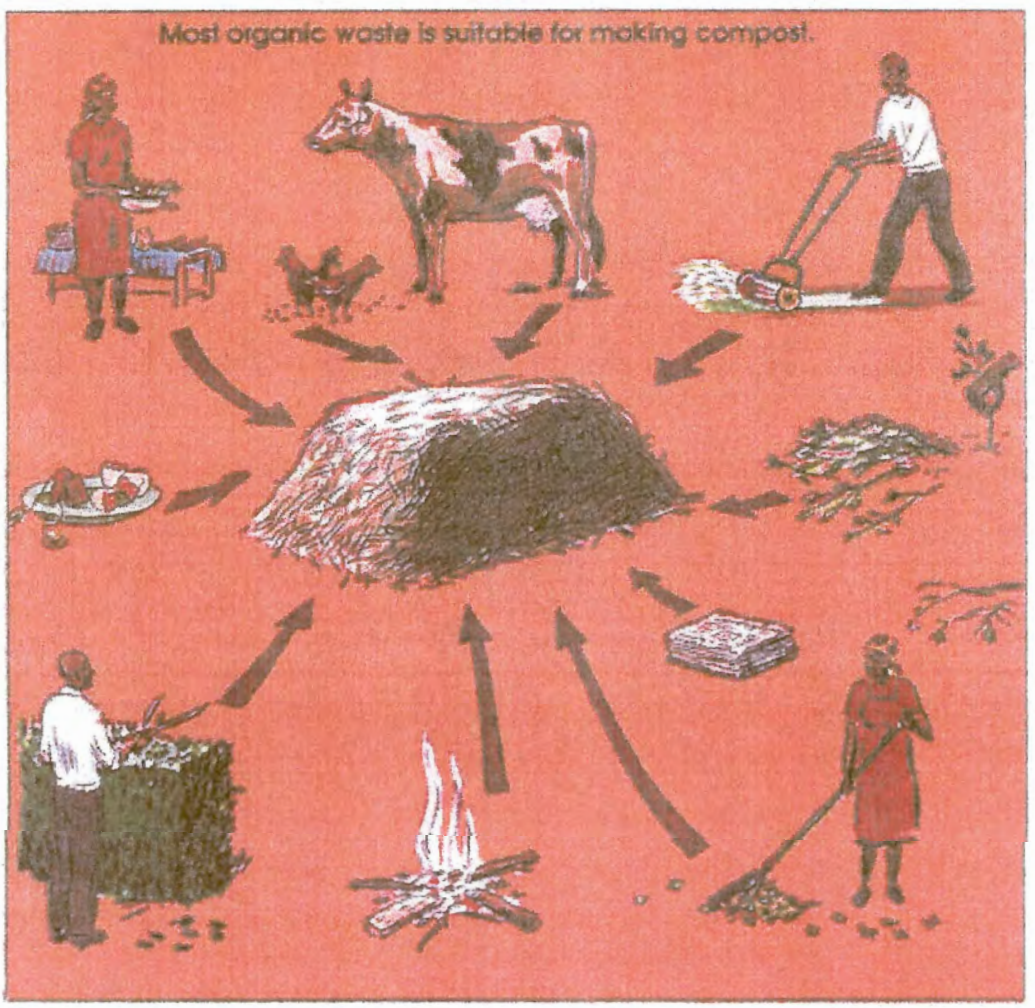
NATURE'S FERTILISER



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For more information about compost:

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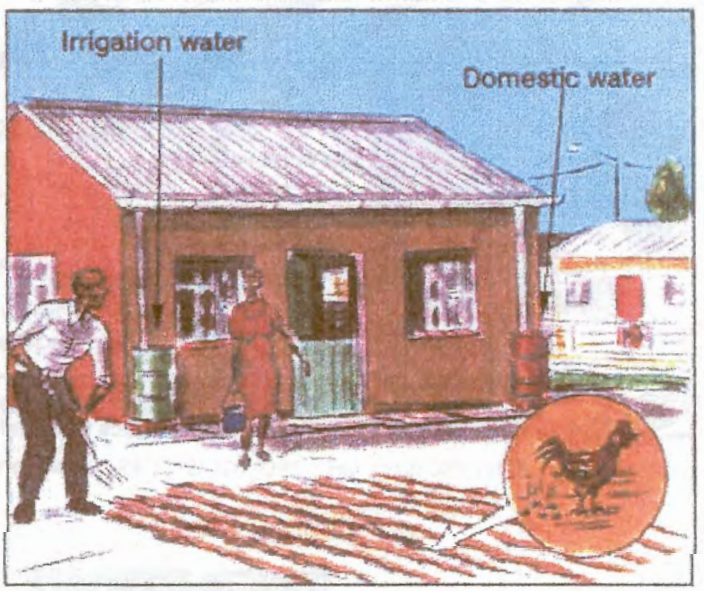
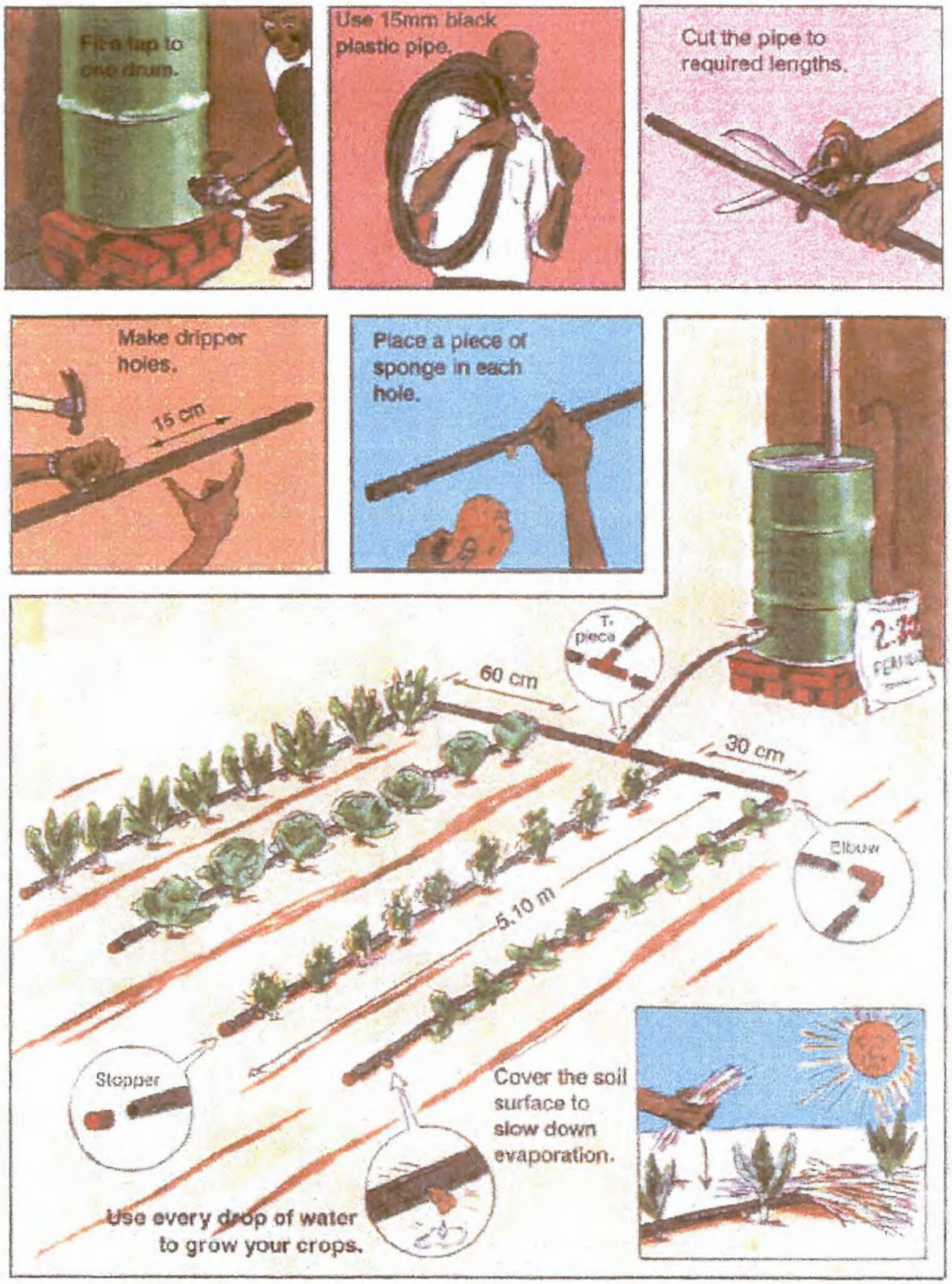
MAKING THE MOST OF RAINWATER





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Thabina Irrigation Scheme
P O Box 696
LETSITELE
0885

25 July 2000

Mrs D van der Merwe
Media Liaison Officer
ARC Institute for Agricultural Engineering
Private Bag X519
0127 SILVERTON

Dear Mrs van der Merwe

INFORMATION CENTRE

We wish to confirm our interest in the establishment of an Information Centre at Thabina Irrigation Scheme.

We are a pilot project for the transfer of ownership of smallholder irrigation schemes from Government to the farmers. The Information Centre will be of great value to us in obtaining information that we can use to manage our project well.

The Department of Agriculture in the Northern Province has agreed to support us by providing an official to run the Centre.

Thank you for your interest in us and we look forward to working closely with you.

Your sincerely

THABINA IRRIGATION SCHEME
DEVELOPMENT COMMITTEE