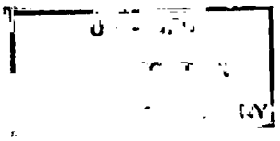

UNIVERSITY OF THE FREE STATE

REDEFINING THE ROLE OF THE EXTENSION AGENT IN COMMERCIALIZING SOUTH AFRICAN AGRICULTURE: AN EASTERN CAPE CASE STUDY

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A thesis submitted in partial fulfilment for the degree of Doctor of Philosophy

Faculty of Natural-and Agricultural Sciences

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Johan Adam Van Niekerk

LIST OF ACRONYMS

AFAAS	African Forum of Agricultural Advisory Services
AGRA	Alliance for a Green Revolution in Africa
AIS	Agricultural Innovation Systems
AKIS/RD	Agricultural Knowledge and Information System for Rural Development
AR4D	Agricultural Research for Development
AGRA	Alliance for a Green Revolution in Africa
AIS	Agricultural Innovation Systems
ARC	Agricultural Research Council
ATMA	Agricultural Technology Management Agency
CAADP	Comprehensive Africa Agriculture Development Programme
CGIAR	Consultative Group for International Agricultural Research
CPI	Communication, Participation and Innovation Extension Model
CRDP	Comprehensive Rural Development Program
DAFF	Department of Agriculture, Forestries and Fisheries
ECDoA	Eastern Cape Department of Agriculture
ERP	Extension Recovery Plan
EU	European Union
FAO	Food and Agriculture Organization
FFS	Farmer field schools
FSR/E	Farming Systems Research and Extension
GCARD	Global Conference on Agricultural Research for Development
GDP	Gross Domestic Product
GFAR	Global Forum on Agricultural Research

GFRAS	Global Forum for Rural Advisory Services
HCD	Human Capital Development
HIV/AIDS	Human immunodeficiency virus that causes acquired immunodeficiency syndrome
IFAD	International Fund for Agricultural Development
LFA	Logical Framework Analysis
LRAD	Land Redistribution for Agricultural Development
M&E	Monitoring and Evaluation
MOAAS	Market Orientated Agricultural Advisory Services
NDA	National Department of Agriculture
NEPAD	New Economic Partnership for African Development
NGOs	Non-governmental organizations
OOIP	Objective-Orientated Intervention Planning
PDA	Provincial Departments of Agriculture
PPPs	Public Private Partnerships
R&D	Research and Development
SAJAE	South African Journal of Agricultural Extension
SASAE	South African Society for Agricultural Extension
SDI	Spatial Development Initiative
SWOT	Strengths, Weakness, Opportunities and Threats
T&V	Training and Visit
USAID	United States Agency for International Development
VERCON	Virtual Extension and Research Communication Network

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1.1 RESEARCH RATIONALE

Sustainable agriculture, which encompasses elements such as maintaining the integrity of entire ecosystems, the continuing supply of natural resources, and the coherence and well-being of communities in rural areas, needs to be supported by adequate knowledge systems. To deal with overarching sustainability concerns such as food security, food safety, ecosystem services, landscape and social equity, these knowledge systems should embrace a holistic approach that recognises complexity, that is, the interrelationships between several of the system's components and the emergent properties that result from their interactions (Bauden, 2007).

Among science, farmers and other stakeholders, one component of such knowledge systems, which is needed to meet the above challenges, is the advisory subsystem in agriculture that is commonly known as the "agricultural extension service". Its goal is to support farmers in their overall farm management, which covers several more specific topics, such as soil management, pest management and also financial management (Klerkx *et al.*, 2010).

Originally, agricultural extension had a strong supply-driven approach that used the technology transfer approach in which farmers were seen as passive recipients of information that they should uniformly adopt and apply. This approach became increasingly criticised because it ignores the highly interactive and locally specific nature of knowledge construction. It is now recognised that to achieve more sustainable agricultural practices, advisors and farmers, as well as other stakeholders, need to engage in a process of joint experiential learning to which all parties contribute knowledge equally (Klerkx *et al.*, 2010).

Therefore, in today's global agricultural economy, this top-down and technology transfer extension approach seems to be an inappropriate model. For public extension

organizations to effectively improve rural livelihoods, the organizations will need to change their structure, focus and approach. International research and donor organizations are now focusing their attention on the agricultural innovation framework and with this, a market-driven and bottom-up (decentralized) extension approaches. This bottom-up extension approach promotes the organization of farmers into different producer groups. These groups can then diversify into different high-value enterprises according to their respective interests and resources. Extension workers can then supply each farmer group with specific management and technical skills that they need to produce and market their products (Swanson, 2008).

According to Eicher *et al.* (2012) universities often have the potential to support agricultural research and extension programs by using existing staff and faculties (e.g. libraries, laboratories, demonstration farms) at little extra cost. There is a need for these universities to upgrade their curricula to meet the needs of the new agricultural problems such as food security, oil, water, marketing and climate change (Blackie *et al.*, 2009). Extension workers need to be trained by these universities.

Currently in many African countries, extension is failing or moribund. Extension staff are bloated, lack mobility, under-trained and, hence they are not pro-active. There is also very little – if any at all – synchronization between research and extension, with even less synchronization between extension and agricultural higher education (Rivera, *et al.*, 2001).

Benor *et al.* (1984) agreed with this sentiment and adds to it by stating that agricultural extension in some developing countries is not effective. They attribute the ineffectiveness of agricultural extension systems to (i) lack of well-defined organization structure with a coherent administrative system; (ii) diluted effort due to assigning officers multi-purpose roles particularly at field level; (iii) planned demonstrations with less involvement of farmers in the planning process; (iv) inadequate training of extension staff in terms on frequency, timeliness, and relevance; (v) performing of non-agricultural assignments by extension staff; (vi) weak ties between agricultural extension and research institutes or stations; (vii) low self-image or status of extension personnel; and (viii) increased incidence of duplication of services. Such a situation

becomes a real challenge particularly in the urgent call for assisting farm families to attain food security.

According to Jibowo (2005), agricultural extension in most African countries continues as a remnant of colonial hangovers. For example, Jibowo (2005) stated that emphasis in agricultural extension tends to be on teaching messages as a support to farmers who grow commercial crops such as soya-beans in Nigeria. Other problems include inter-organizational spanning.

The public agricultural extension organization in developing countries has in the past been given the complex task of supplying recommended new agricultural technologies to large numbers of poor and uneducated farmers. These organizations are constrained further by having an insufficient amount of properly trained staff, insufficient extension program resources at field level and organizational issues, such as having a top-down approach (Swanson, 2008).

According to Gemo *et al.* (2005) donor support to agricultural extension is declining in Africa. There are three basic reasons. First, many of the extension models imported from other continents have not been productive and financially sustainable under African conditions. Second, most academic and donor experts in extension have underestimated the time and continuity of national and donor funding that it takes to build productive and financially sustainable national agricultural extension systems in Africa. Third, history has show that in many countries extension workers lack access to a steady flow of new agricultural technology that can raise smallholder crop yields and farm profitability on a recurring basis.

In South Africa, the agricultural extension service was formally established in 1924. However, prior to the 1950s the state was not generally engaged with planned agricultural development amongst South Africa's indigenous population (NDA, 1998). Settlers and missionaries used agriculture as one of the means of 'civilizing' the country, including keeping African men at home to participate in church activities. As early as 1915, documentation records the introduction of the plough and other technologies such as crop rotation and plant spacing. Concern was raised that the local population should

be trained in proper (Western) agriculture rather than be allowed to continue with traditional livelihoods and methods (Kingon, 1915).

Bundy (1988) noted that the geopolitical entity of South Africa evolved in broad sweeps from indigenous governance, the arrival of European settlers, colonial governance, the Apartheid era, to the current democratic state. As this history unfolded, agriculture expanded in both the black and white communities. Tribal-based agriculture gave rise to peasant farming among the black communities, while the white settlers pursued commercial farming. Advances in agriculture in the black community were often met with increasingly restrictive measures designed to ensure that white farmers were the first beneficiaries of the agricultural capacity of the land and which lead to the general demise of black peasantry to sub-subsistence farming, farm labour and migrant labour to the service the white cash economy (Bundy, 1988).

Once the basic structures of separate development and apartheid were in place, the state began formally providing support to black agriculturalists (in their reserved territories). As is noted by the NDA (1998), a parallel system of extension developed, one for commercial white farmers, and one for subsistence black farmers. The service supporting white farmers was better trained and better funded than that of their black counterparts. This extended to the agricultural colleges and university agricultural faculties established in the first half of the 20th century. Other policies limiting access by non-whites to education and economic infrastructure widened the divide between black and white producers (Worth, 2006).

In addition, parastatal organizations to promote agricultural development emerged, particularly in the homelands. They largely pursued an agenda of commercialization of smallholder farming based on state managed or state support, capital intensive production schemes. In the homelands, these agencies worked in tandem with the homeland extension services. The agricultural parastatals were developed to compensate for the generally low level of skills among extension practitioners trained in the colleges and universities (Worth, 1994; Machete, 2004 and DBSA, 2005).

According to Conradie (2002), it is in the agricultural and development arenas that the efficiency of planning and service provision, and that of local community managerial and

administrative capacity, impact critically upon one another. Smallholder agricultural productivity in South Africa is generally regarded as very low. Improving smallholder agriculture requires that support services be accessible to the majority of smallholder farmers. In addition to support services, there are numerous inadequacies that need to be rectified, these include:

- Investment in physical and institutional infrastructure in rural areas;
- Deteriorating roads in the rural areas have increased the cost of transport;
- Crime prevention and control. Numerous farmers and their family members have been robbed or murdered, and livestock theft is a major problem that has financially crippled many farmers;
- Human capital is also being drained from agriculture, with educated youths seeking vocations in urban areas or abroad; and
- The flow of capital out of rural areas.

HIV/AIDS is another serious socio-economic problem in South African agriculture. The capacity of small-scale farming households is limited, as the effects of HIV/AIDS can prevent them from utilising their land effectively – infected members are too weak to perform farming tasks, and members with valuable farming skills are dying of the disease (Joint United Nations Programme on HIV/AIDS & United Nations Development Programme, 2000).

The shift to more sustainable farming practices is not a question of adopting new technologies, but rather a shift in the entire paradigm of farming which can be achieved only on the basis of incremental learning. The debate about sustainable development emerged in the 1980's and made inroads in global headlines at the United Nations at the Rio de Janeiro Earth Summit of 1992. The most common definition that emerges from the United Nations Brundland Commission on our common future, refers to sustainability as development that meets the needs of the present generations without compromising the ability of the future generations to meet their needs. The term *sustainability* is an integratory and cross-sectional concept (Sutherland, 1998). In

essence, sustainability encompasses issues that refer to what must be sustained, for whom and for how long, for whose benefit, at whose cost and according to which criteria. Sustainability is furthermore an issue of intergenerational equity, a redistribution of rights or the transfer of assets to future generations (Norgaard, 1991).

This study addresses the extension worker's challenge to assist small-scale farmers in South Africa with a view to becoming sustainable and commercially-orientated farmers. The small-scale farmers have limited technical expertise, and only a partial understanding of market requirements. In addition, they have not benefited to the same extent as their commercial counterparts from past agricultural support measures in this country, or in other developed countries. As a result, small-scale farmers in South Africa still have to manage basic issues such as pre- and post-harvest marketing and how to enter local and global markets, while their commercial counterparts are focusing on issues relating to improving their competitiveness.

Developing the rural areas in the former homelands of South Africa Province, such as the Transkei and Ciskei in the Eastern Cape Province, has been largely unsuccessful. There is a need for an effective and sustainable development strategy and model on which rural development initiatives can be based. Agriculture, and smallholder farming in particular, have an important role to play. In this study, the agricultural extension system in this province will be analyzed and a new model for extension in the Eastern Cape will be proposed, if necessary,and this will act as an effective and sustainable development model to be used in agricultural development. It seems that there is a need for such a new model, as people living in such areas are often poverty stricken and food security is a daily battle which is faced. One of the challenges facing agricultural extension in South Africa is to reshape agricultural extension in such a way that extension workers and other agricultural development practitioners are equipped to deliver relevant support to farmers and farming communities (Worth, 2006).

According to Düvel (2004) the development of a new agricultural extension model should be fully participatory in nature, thereby enhancing a sense of ownership and responsibility by all actors involved.

This study emphasizes the need for the extension workers to be facilitators of knowledge development of small-scale farmers to ensure productivity and improvements in these farmers' livelihoods.

1.2 IMPORTANCE OF THE STUDY

It has become evident that after meeting heads of extension in the Eastern Cape that South Africa's public extension service, especially in relation to small-scale farmers has performed poorly. This research will tend to draft a new model and system for the extension service in the Eastern Cape in order to meet the needs of the struggling small-scale farmers.

1.3 RESEARCH OBJECTIVES

1.3.1 Identify the perceptions of extension workers and agricultural researchers on influential factors that support effective extension:

1.3.1.1 Participants are requested to respond to factors that enhance the effectiveness of extension workers.

1.3.1.2 Participants are requested to respond to factors that hinder the effectiveness of extension workers.

1.3.2 Identify the actual needs of a small-scale farming community via a log frame analysis to:

1.3.2.1 Identify the problems these farmers face by constructing a problem tree.

1.3.2.2 Identify the solutions for the problems by constructing an objective tree.

1.3.3 Identify the opinions of the extension workers of the Eastern Cape's public extension service via:

1.3.3.1 A SWOT-analysis to evaluate the Strengths, Weaknesses, Opportunities and Threats of the extension system in the Eastern Cape.

1.3.3.2 Conduct a log frame analysis with extension workers to determine the problems they face with the extension system by constructing a problem tree and converting the problems into solutions by constructing an objective tree.

1.3.3.3 Identify intervention strategies that need to be fulfilled to reach the objectives and desired outcomes.

1.3.3.4 Design a Logical Framework Matrix for Extension Worker's.

1.3.4 Identify the opinions of the agricultural support services, such as actors from agribusinesses and agricultural economists via:

1.3.4.1 A log frame analysis to determine the problems they observe with the current extension system by constructing a problem tree.

1.3.4.2 Possible solutions to the problems by constructing an objective tree.

1.3.4.3 Identify the activities to reach the solutions of the objective tree.

1.3.4.4 Design a Logical Framework Matrix for the Agri-Support Service.

1.3.5 Develop a matrix with the influential factors for effective extension and the actors involved – and their level of involvement –in developing these influential factors;

1.3.6 Examine new developments in the field of agricultural extension; and

1.3.7 Develop a new extension model for the Eastern Cape Province, which is based upon the satisfying of the above objectives.

1.3.8 Develop a Strategic Programme for Small-Scale farmers, Extension workers and Agri-businesses through a combined log frame analysis.

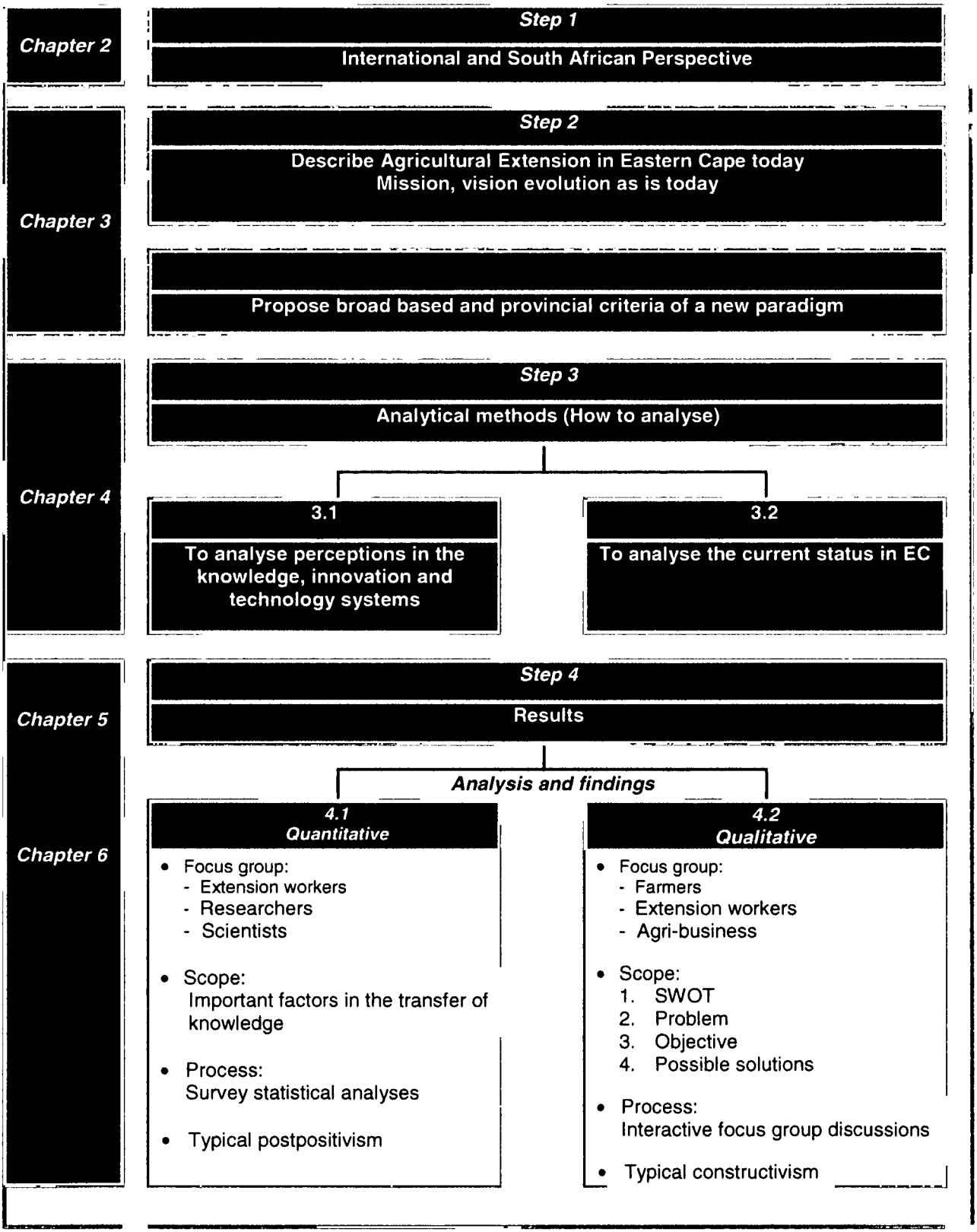
1.4 HYPOTHESIS OF THE STUDY

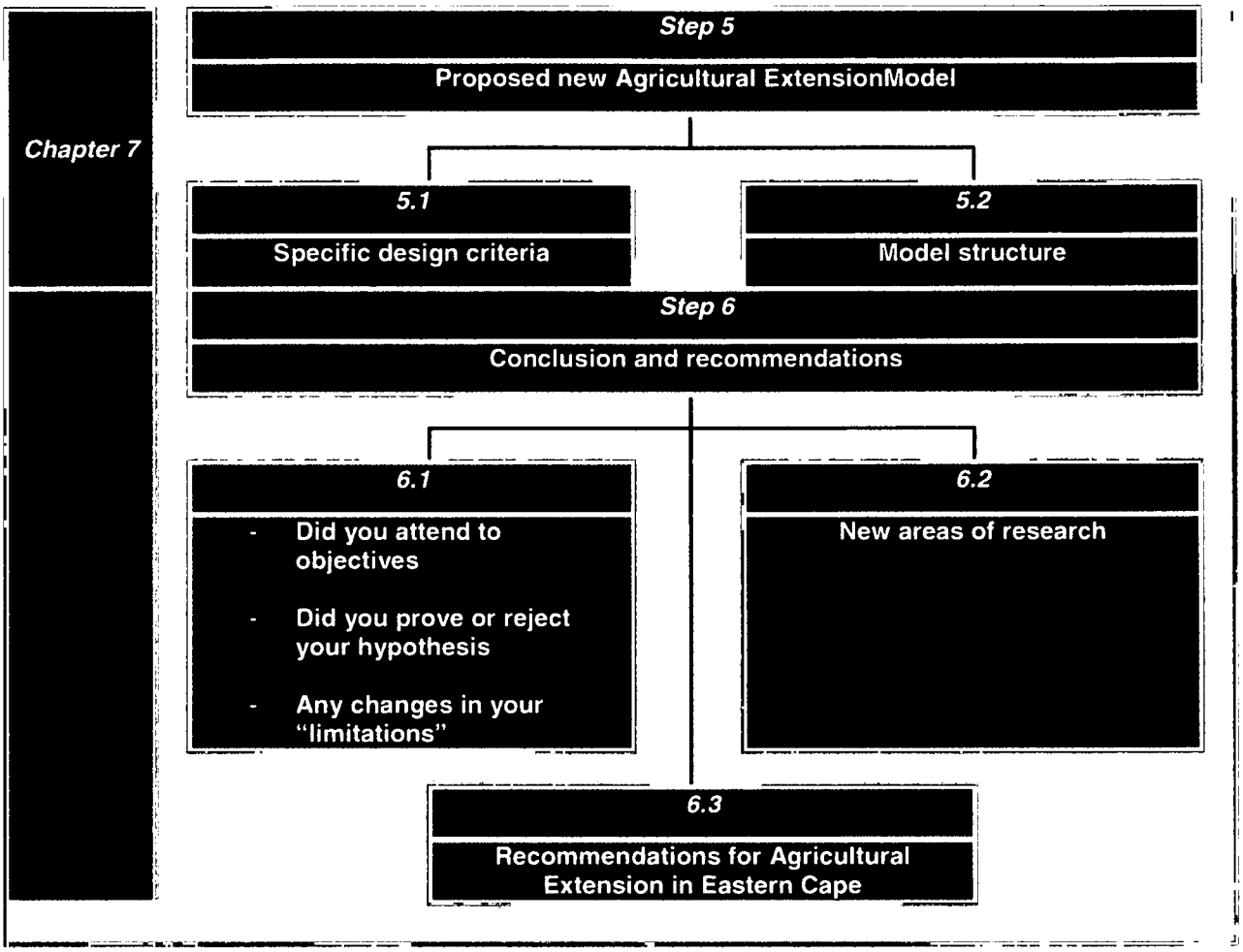
This study hypothesises that (I) the extension model used by the public extension service in the Eastern Cape in South Africa is insufficient for farmer's need because it is a "top down" approach with ineffective farmer development and support that leads to farmers that can't farm sustainable and produce food and income for the household. (ii) A new model, the Communication, Participation and Innovation (CPI) is implemented that incorporates the needs and views of small-scale farmers, extension workers and extension support services to enhance food-security in this Province. Information transfer is needed as core actions in this CPI model.

1.5 LAYOUT OF CHAPTERS

This section develops a framework of analysis (Table 1.1) for the development of an extension model for the Eastern Cape Province. This framework should be able to explain the steps that will lead to the development of an extension model for the Eastern Cape Province. It also gives a layout of the different chapters.

Table 1.1: Framework of analysis





The first step in defining a public agricultural model/paradigm for the Eastern Cape Province will be an analysis of the history of extension in South Africa as well as an analysis of the history of extension in the world and new developments in extension throughout the world. The second step involves a description of the present agricultural extension situation in the Eastern Cape and it includes the mission, vision and evolution of the public extension service.

The second step is also the determination and proposal of criteria that are important – according to the Eastern Cape's context – in developing an agricultural extension model/paradigm. The third step consists of the research methodology or analytical methods that are going to be used in analyzing the results from the various focus groups. Step 3 is divided into two steps, with Step 3.1 being the analysis of quantitative

data from surveys seeking to determine perceptions in factors of effective extension. Step 3.2 details the qualitative research methods used with three focus groups.

The fourth step is the findings of the research and analysis thereof. The fourth step is also divided into sub steps according to the type of research method. Step 4.1 follows a process in statistical analyses of the survey – typically post-positivism – around the important factors in the transfer of knowledge. The focus group here are extension workers and, agricultural researchers and scientists. Step 4.2 follows typical constructivism as the process consists of interactive focus group discussions. Three different focus groups were used; these were smallholder farmers, extension workers and representatives from the agribusiness industry. The purpose of this was to determine each focus group's opinion on problems, objectives and possible solutions surrounding the public extension service. A SWOT-analysis was also conducted with the extension officers.

The fifth step is the proposed new agricultural extension model for the Eastern Cape. This is again divided into sub steps; Step 5.1 concerns the specific criteria used in designing this new agricultural extension model. Step 5.2 details the new extension model and the various procedures involved in its functioning. The sixth and final step is the conclusion and recommendations. This step is divided into three subsidiary steps. Step 6.1 has three questions. Firstly, were the study's objectives attended to? Secondly, was the hypothesis proven or rejected? Thirdly, were there any changes to the study's limitations? Step 6.2 details new areas of research that have evolved from this study, such as testing the new model under pilot conditions. Step 6.3 is the last part and this concerns recommendations for agricultural extension in the Eastern Cape.

1.6 LIMITATIONS OF THE STUDY

(i) Scope: Due to large population (900 extension workers; approximately 250 000 small-scale farmers; and large numbers (100+) agribusiness, researchers andother support agents) the quantitative research included a maximum number

of 100 researchers and 100 extension workers. The qualitative research used around ten persons per focus group.

(ii) Consistency: Due to a vague and weak specified agricultural extension policy statement in the Province, as well as high turnover of senior administrative staff, consistent views and opinions are challenging to verify.

(iii) Time frame: The time frame for the study was from September 2009 – September 2011.

CHAPTER 2

AN INTERNATIONAL AND SOUTH AFRICAN REVIEW ON AGRICULTURAL EXTENSION PARADIGMS

2.1 INTRODUCTION

This chapter covers the origins of agricultural extension in Europe, North America and South Africa so that the reader can attain an understanding of why extension came about and its original purpose. Various agricultural extension approaches, systems and models have been developed from these original initiatives. A number of extension approaches will be explained and thereafter analysed for their applicability within the context of the Eastern Cape's smallholder and communal farmers as well as new developments in the agricultural environment and extension sciences. Thereafter, previous research conducted on the impact of extension will be discussed. The approaches referred to are:

1. Technology Transfer;
2. Participatory Approach;
3. Training and Visiting (T&V) System;
4. Farming Systems Research and Extension (FSR/E);
5. United States Co-operative Extension System; and
6. The Agricultural Knowledge and Information System for Rural Development (AKIS/RD).
7. Farmer Field School

2.2 ORIGINS OF AGRICULTURAL EXTENSION IN EUROPE AND NORTH AMERICA

The mid 19th century saw the start of institutionalisation and public funding of organised extension activity concerned with agriculture and rural life. Preceding this activity, very informal sharing amongst rural people existed. People in rural areas often shared ideas, beliefs, knowledge and information in the form of common as well as more unusual experience of solving problems in their farming and everyday life (Rolls *et al.*, 1986).

Extension work in Europe began with the creation of a small force of itinerant agricultural instructors in Ireland in the late 19th century (1847-1851) at the time of the serious potato crop failures. In response to the crop failures, the fourth Earl of Clarendon sought to stimulate changes in both the cropping and the associated husbandry practices of impoverished Irish small farmers. The Earl of Clarendon's aims was to reduce the dependence of the peasant workers on potatoes crops and to create a system of farming that was much less prone to attacks by the potato blight fungus. These aims were reached not by making use of market forces or legislative authority, but by means of activities which were essentially informative and educational. Such activities were organised in such a manner as to ensure that reliable innovations became quickly available to large numbers of small farmers who were in a situational crisis. The impact of these actions was substantial and beneficial (Rolls *et al.*, 1986).

The Morrill Act of 1862 established the first land-grant "Colleges of Agriculture en Mechanic Arts" in the United States. The Hatch Act of 1887 dedicated funds for the land-grant universities and their state agricultural experiment stations for them to do research on subjects relevant to help solve farmer's production problems. The second Morrill Act (1890) provide further endowment for more land-grant colleges, primarily for the African American Community providing further endowment for additional agricultural experiment stations (Buttel, 1991).

The Land Grant College system of extension is an example of a system which integrates the functions of teaching, training, extension and research, all of them being the responsibility of a state university (Röling, 1988). There are currently in the US a little over a 100 land-grant universities including the tribal colleges which were enabled

by a law from 1994. In respect to their year of legal introduction land-grant universities are often referred to as 1862, 1890 or 1994 institutions (Hoffmann *et al.*, 2009).

In every state in the USA there are official cooperative extension workers. The head branch is located at the respective land grant university and administers a number of local offices spread all over the state. Farmers can ask advice from extension staff in these offices during opening hours (Hoffman *et al.*, 2009). Röling (1988) emphasizes that the land-grant extension system is not only designed to transmit knowledge "top-down", but also to reports needs of the farmers back to the research institutions.

The activities of land-grant universities are being watched over by a "board of trustees" consisting of majorly non-academic personnel. There is often an underrepresentation of certain groups, for example farmers or workers, and the overrepresentation of "upper class" members with financial, organizational and/or political powers (Woodward, 2009).

In Germany the first extension workers were employed by regional Agricultural Societies as itinerant teachers around 1850 (Gsell, 1886). Later on, governments took over more and more responsibilities in agricultural extension. The Agricultural Societies merged and survived as the powerful "German Agricultural Society" rendering a wide range of services to its members (Hoffman *et al.*, 2009).

The next initiative came from university side. A well-known German expert in plant production, Teodor Roemer, was called back from Africa to get the chair of agronomy at the Univesrity of Halle (Von Nathusius, 1955). The successful experimental circles was found by him in which he offered his graduates as circle "leaders" and the scientific support for design and analysis through his institute.

The farmers grouped themselves together in circle associations and employed and paid the circle leader. He found a newspaper, the "Agricultural Experimental Circles Journal" for information exchange. In 1930 after 10 years of circles there were more than 600 circles (Roemer, 1931).

Two events caused the preliminary end to the circles. A farm crises affected the Eastern large holdings, getting highly indebted, and government together with the lending institutions only gave additional credit when an external manager was employed. It

created better paid jobs for many circle leaders. After 1933 with the Nazi regime all agricultural organizations were merged into the "Reichs-Nährstand", giving no more room for independent farmer organizations (Hoffmann *et al.*, 2009).

East Germany were turned into a socialist republic after World War 2 under Soviet occupation with collectivized agriculture. It was only in the north of Western Germany that the structural conditions allowed the restarted of advisory circles. In the South, farm sizes were too small for private extension. In the eighties and nineties, debates about public funding of advisory work started, first with differentiating between public and private interest, and then withdrawal support for production technology oriented advisory work. Because of the reorganization of the chambers of agriculture the advisory circles lost their subsidies and shrank in size and numbers (Hoffmann *et al.*, 2009). In those states that provide advice through a public extension system, organized by their ministries of agriculture, new advisory circles developed.

2.3 ORIGINS OF AGRICULTURAL EXTENSION IN SOUTH AFRICA

After the Dutch settled in the Cape in 1652, settlers began to slowly migrate northwards and eastwards. During this time, black tribes were migrating southwards along the eastern seaboard of Africa. Around 1770, white settlers met the migrating blacks in the area around the Great Fish River, which resulted in years of frontier wars. In addition to this eastern movement by white settlers, other white settlers moved northwards so that they could regain their independence that they lost to the Government of the Cape. This northern movement led to more conflict over land between white and black people. As white settlers moved inland, they acquired more land through either purchase, negotiation or conquest. As white settlers acquired new territories, territorial (provincial) governments were established.

According to Ortmann *et al.* (2007), after hostilities between the white and black settlers, the territorial governments stepped in to help with the process of white-territorial expansion.This led to the following actions taking place:

- The Native Land Act, No. 27 of 1913, promulgated by the Union Government in 1913, led to land being reserved for blacks. This reserved land was that which was occupied by black people at the time of the Union (1910) (Nieuwoud*et al.*, 2003);

- In 1936, the Native Trust and Land Act, No. 18 of 1936 was promulgated in the Union Parliament after protracted debates. The Act made divisions of land for blacks into what was known as Scheduled and Released areas (Van Niekerk, 2009); and

- Act 18 of 1936 described the Scheduled Areas as 9.2 million hectares of land that was set aside for black occupation, while the Released Areas consisted of 6.2 million hectares of land owned by the white population that would be included into the Scheduled Areas. These Released Areas, often referred to as 'quota land', was distributed amongst the provinces. Thus, the black people within South Africa had assurance for a minimum area of land, which was for their exclusive occupation (Van Niekerk, 2009).

Before these Acts were promulgated, a large numbers of black families came to settle on white-owned farms and in towns, before as well as after the termination of hostilities between black and white people. Diamond discovery near Kimberley in 1869 and later, the discovery of gold on the Witwatersrand in 1886 led to a large-scale migration of blacks from traditional areas. Traditional systems of agriculture became increasingly less productive because black people now had cash in their pockets, employment outside the black areas and food that was produced on white farms (Koch, 2007).

In terms of agriculture, agricultural education was first started by the missionaries. In addition, the Government promoted agriculture from early on.In 1905 at Teko in the southern Transkei, the first School of Agriculture was opened. In 1930, in order to train black farmers, the Fort Cox College of Agriculture was established in the Ciskei. By 1960 in Lebowa, the Tompi Seleka Agricultural College was opened. By 1965, a fourth college was opened adjacent to the Vaalhartz Irrigation Scheme at Taung.

At this time, the extension fraternity underwent a critical self-evaluation and retrospection. After evaluation and observations the fraternity recognized that:

- Although there were cultural differences between the African and European cultures, the future of these two groups was inextricably bound together. This is still a fact today;
- Effective agricultural extension for developing communities needs extensionists who have above-ordinary abilities and possibly a higher level of extension training compared to extensionists that serve First-World agriculture as the challenges are greater in developing communities; and
- Cattle occupied a special place in the culture and lives of black people. Consequently, they were strongly opposed to stock limitation, although a few exceptions existed. Provisions to impose stock limitations even created open hostility and these hostile attitudes had serious implications for the implementation of soil conservation programmes. It could be predicted that communities who go into partnership with extension could attend to such issues – in a similar manner to the conservation role performed by extensionists in "white agriculture". Extension is, in any way, the technical role player and natural partner in any such exercise (Koch, 2007).

In 1976, Transkei became an independent state. This set off a train of events which had far-reaching political effects, which affected agricultural development and Extension. With this independence, the prescriptive or top-down approach towards development had to change to a process of educating and persuading people. The publication of the Tomlinson Report in 1956 made the following statements (Thirtle *et al.*, 2000):

- It was strongly emphasised that the procedure forcomprehensive development begins with the growth of the people's inherent but latent potential;
- The attitude of black farmers towards farming should be improved as quickly as possible through extension and training; and

- It also became obvious to the Department of Agriculture that their prescriptive planned programmes, such as limiting stock numbers, could not be forced upon farmers while at the same time, co-operation from these people was required and expected. It was also recognized that a large amount was being done for the black farmers with little contribution from themselves, or they were not presented with the chance to make their own decisions and do things themselves.

With wisdom gained through hindsight,it became apparent that the agricultural development programmes before 1930 were not sustainable due to a prescriptive, top-down approach that was the agricultural development paradigm of the time (Koch, 2007).

It is significant to note that in the late 1950s a need for a more scientific approach of extension was identified. This identification was led by the Southern African Regional Commission for the Conservation and the Utilization of the Soil (SARCCUS) in this region. SARCCUS also served a role in sharing knowledge and experience in the field of agricultural extension between member governments so that agricultural development could be initiated more adequately.In Pretoria during May 1961, SARCCUS convened the Regional Seminar on Agricultural Extension during which a unanimous recommendation was made to conduct an Extension Methods Workshop. This workshop was conducted in the then-Salisbury (now Harare) in May 1962. The proceedings from this workshop were consequently published in book form. This publication as well as an officer being appointed to co-ordinate extension efforts led to a formal extension service for black farmers (Koch, 2007).

2.4 EXTENSION APPROACHES, SYSTEMS AND MODELS

There is no single extension model or approach suited to all socio-economic situations in South Africa. All of the following strategies are valid – and have been effective – in extension initiatives. However, prevailing conditions will dictate the choice and combinations for implementation.

2.4.1 Technology Transfer

The technology transfer model was the typical extension model used in post-independence countries and is based upon the linear concept of technology transfer. This model was meant to function as the link between research, extension and the farmers. This extension approach was strongly reinforced during the Green Revolution, which was characterised by the introduction of new crop cultivars and the accompanying production practices to all types of farmers. This was used to achieve national food security and was particularly successful in Asia (Hoffman *et al.*, 2009).

Having said this, technology transfer can be defined as the process of disseminating new innovations and/or practical technologies that are mainly the result of research and development efforts in the different fields of agriculture. The traditional technology transfer model for staple food crops was linear, supply driven, based on efficiency and had specific objectives, which included increasing crop yields while reducing the production costs of growing staple food crops (Swanson *et al.*, 2010).

This approach is relevant and important in many respects. Technology transfer is an integral part of extension, although it is only a part of the extension process. The Agricultural Research Council (ARC), Provincial Departments of Agriculture (PDA), development institutes, academic institutions and private sector have a responsibility not only to develop innovations, but also to diffuse them.

According to Machete (2004) in South Africa, agricultural extension and its research companion have generally offered technology as the answer to wealth creation among materially poor smallholder farmers. Technology is made the centrepiece of poverty relief and wealth creation. However, the impoverished existence of poor smallholder farmers, despite the dissemination of aplethora of scientifically researched technologies, suggest that the answers fostering prosperity among smallholder farmers lies beyond the mere development and adoption of technologies.

Although this extension approach was very successful in the Asian 'Green Revolution', its effectiveness was limited in Africa. According to Düvel (2000) points of criticism against the technology transfer model have been that it is too uniform and does not take

into due account the socio-cultural environment, the particular circumstances in which project implementation occurs, and the characteristics of the different clientele groups. In addition to this, the objectives of extension have changed over the past 20 years. Whereas in the past extension objectives was the use of technology transfer for increased production, now the objectives are to improve rural livelihoods so that poverty and food insecurity are reduced. While technology transfer is still used in this regard, it is now complemented by human capital development of farm households, social capital development through farmer organizations and sustainable natural resource management (Swanson, 2008). Thus, technology transfer must still be included in the new extension model, but it must not be the "be all and end all".

2.4.2 Participatory Approach

The participatory approach – and the associated participatory planning – builds on farmers' own capacities and their ability to organise themselves into groups to identify needs and priorities, plan extension programmes/projects and, implement and evaluate these. There are a multitude of participatory approaches, but the most common are Animation Rural, Integrated Rural Development and Farmer-Based Extension Organizations. Animation Rural was the first participatory approach used in extension. The approach was used by the French in francophone Africa to raise group consciousness and create collective action to identify and solve local problems (Nagel, 1997). This approach is still occasionally used today, but the official program stopped due to the farmers wanting technical information rather than raised consciousness (Swanson *et al.*, 2010).

Integrated Rural Development started in the 1960's and still continues today. The approach aims to follow a holistic approach that focuses on the whole community as well as integrating non-agricultural activities into rural development programs. This approach is mostly used by donor organizations rather than government agencies (Swanson *et al.*, 2010). Farmer-Based Extension Organizations is a completely demand-driven extension system and it is controlled and financed by the farmers themselves. This approach is common in industrialized countries where the commercial

farmers manage the services they receive from extension agencies. The approach does require the farmers to have well-developed leadership and organizational skills. Mixing poor and/or small-scale farmers – without these skills – with commercial farmers is found to be unsustainable as the commercial farmers tend to dominate these systems. The participatory approach has merits in that it incorporates a bottom-up approach and thus the farmers' problems can be solved within their specific context. This is the inverse of the top-down approach, within which farmers are given technologies that are not suited to their specific context of production. Leeuwis (2004), however agrees to the bottom-up approach that is incorporated here, but argues against this approach as it still implies that social processes can be controlled. He states that to induce change and innovation, one should rather use negotiation, social learning and network building as the core processes. Thus in the new model to be developed for the Eastern Cape, one must incorporate participation without the view of trying to control social processes.

2.4.3 Training and Visit (T&V) System

According to Swanson *et al.* (2010), the World Bank introduced Training and Visit(T&V) into approximately 70 countries from the mid 1970's to the mid 1990's, mainly in Asia and Africa. The reason behind the World Bank's investment was to accelerate the dissemination of technologies associated with the Green Revolution. Other objectives of T&V were:

- The strengthening of the extension management system;
- Improving the ratio of extension worker to farmers by hiring more field staff; and
- Provision of basic support services to extension workers in the field.

This approach was technology driven and consisted of the dissemination of wheat and rice cultivars and production-management practices. T&V had initial success on irrigated farms in the late 1970's and 1980's with what was known as the Green Revolution. However, Green Revolution technologies were not appropriate in rainfed areas and T&V had limited success. This was due to extension workers not having economically-useful messages for these farmers and the extension workers did not

have training in needs-assessment techniques and therefore they could not identify alternative production systems or technologies that could have addressed these types of farmers' needs. A diagrammatic representation of the T&V System is portrayed in Figure 2.1.

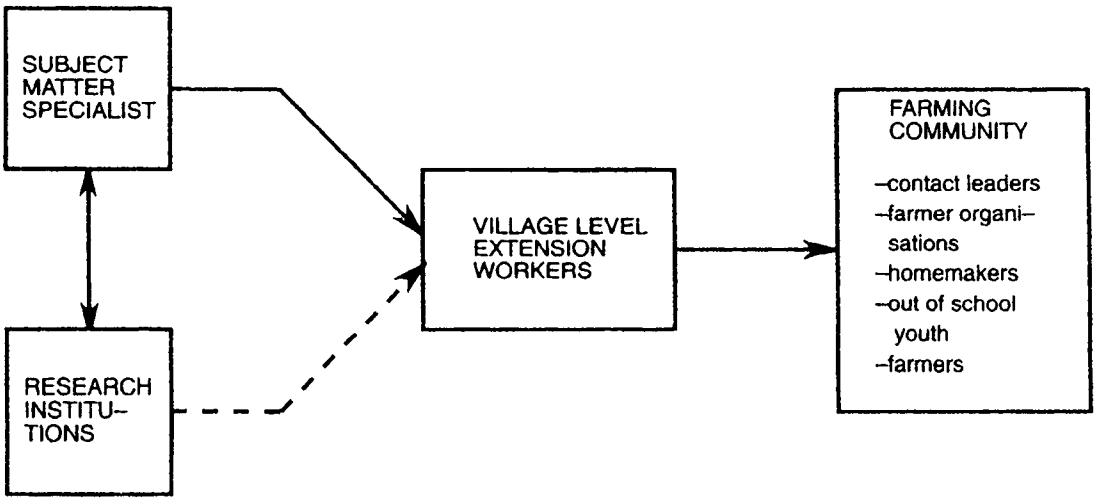


Figure 2.1: Information flowchart of the T&V system (Benor *et al.*, 1984)

According to Anderson*et al.* (2006), the T&V extension system has its foundation in classical management principles. These include:

- The extension worker has the primary responsibility for performing extension functions;
- Extension must have close linkages with research;
- Training must be performed regularly and continuously;
- Extension activities must have a time frame; and
- Farmer and field orientation must be maintained.

Swanson *et al.* (2010) state that although T&V accelerated the dissemination of technologies associated with the Green Revolution in irrigated areas, as well as having a positive short-term payoff and even stimulating some public extension systems to be privatised, there were also negative effects. These are:

- T&V had a low impact in rainfed areas as the technologies were inappropriate;

- The increase in the number of extension workers led to long-term and severe budget problems once World Bank funding stopped;
- Due to the above-mentioned budget problems, field extension workers and subject-matter specialists had little to no financial resources to plan and implement extension programs;
- Extension workers who were hired during this period were inadequately trained in complex extension activities and were unable to truly help farmers who were not farming on prime, irrigated farms. Many of these extension workers only had high school education and they had inadequate training in skills needed for farmer development and in implementing new extension programs, such as organizing farmer groups and helping farmers to choose enterprises that have high rewards; and
- Due to the above, most of the field-level extension workers would spend most of their working hours sitting in their offices.

It is confirmed by Rivera*et al.* (2004) that the single most crucial factor that brought about the dismantling of the T&V extension system was the lack of financial sustainability and the high cost of the system. According to the World Bank (2006), once the World Bank ceased funding, the T&V system could not be sustained.

Although the T&V System had its merits in some respects, its practicality is limited today as can be seen by the withdrawal of this system and the associated funding. However, there are lessons that can be learnt from this system that can be incorporated into the model that will be developed. Firstly, dissemination of appropriate technologies and innovations needs to be accelerated in order to improve the livelihoods of farmers. Secondly, production systems need to be identified and developed for the different prevailing conditions (socio-economic and physical). Thirdly, extension officers must be educated in the principles of extension, should be trained regularly and have close linkages with research. Fourthly, extension activities should have a time frame. Following this, the negative aspects need to be examined so that the same mistakes do not re-occur. Therefore, appropriate technologies need to be developed and disseminated, the model and its application should not cause budget constraints, there needs to be funds to implement programmes, extension officers need to be adequately

trained and the extension officers need to be in the field. These factors need to be considered in the designing of any new model and in this research a new model for the Eastern Cape.

2.4.4 Farming Systems Research and Extension (FSR/E)

During the 1970s, the concept of farming systems was applied to several activities which focused on small-scale family farmers who almost always reap a disproportionately small share of the benefits from the organised research and extension system (Normon, 1980). Aimed at improving these farmers' lives, as well as their agricultural productivity, this approach was based on:

- First-hand understanding of the farmers' situation; and
- Combined efforts of scientists from a number of disciplines who analyzed the farm as a system rather than isolating its individual components.

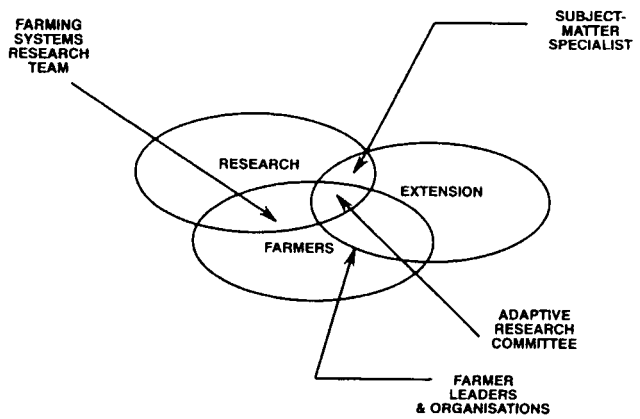


Figure 2.2: A simple concept of linkages among research, extension and farmers(Collinson, 2000)

Figure 2.2 shows the linkages between research, extension and farmers. The farming system concept started with the realisation that a certain form of technology was not accepted by farmers as it did not fit in with cultural norms. For example, certain improved varieties of maize have been rejected by small-scale farmers in several countries because of their poor flavour, even though they have shown a much higher yield than local maize. Hence the reason why researchers and extension officers need to work in conjunction with farmers so that interventions can be appropriate for farmers

and the likelihood of farmers adopting these interventions will be greater (Bembridge, 1991).

The farming systems research and extension model (FSR/E) is a multidisciplinary model for technology development combining research and extension efforts. It consists of four major activities (see Figure 2.3) and these activities or steps are:

Step 1: Information should be gathered. Specifically target geographical areas with similar characteristics must firstly be defined, then the situation within which farmers are working must be diagnosed and important problems and constraintsrequiring attention from researchers should be defined.

Step 2: Using the information obtained in Step 1, research needs must be determined. After this applied adaptive research trials should be designed, either on experiment stations or farmers' fields, or with their animals.

Step 3: After the research directions have been chosen and preliminary results of experiments obtained, the next step is to test the technology on selected farms to verify whether the technology can be used by farmers and to adapt it if necessary.

Step 4: The final step is to demonstrate that the technology can be managed by farmers and that it significantly improves current farming practices. Securing the adoption of the technology becomes the focus of extension programmes.

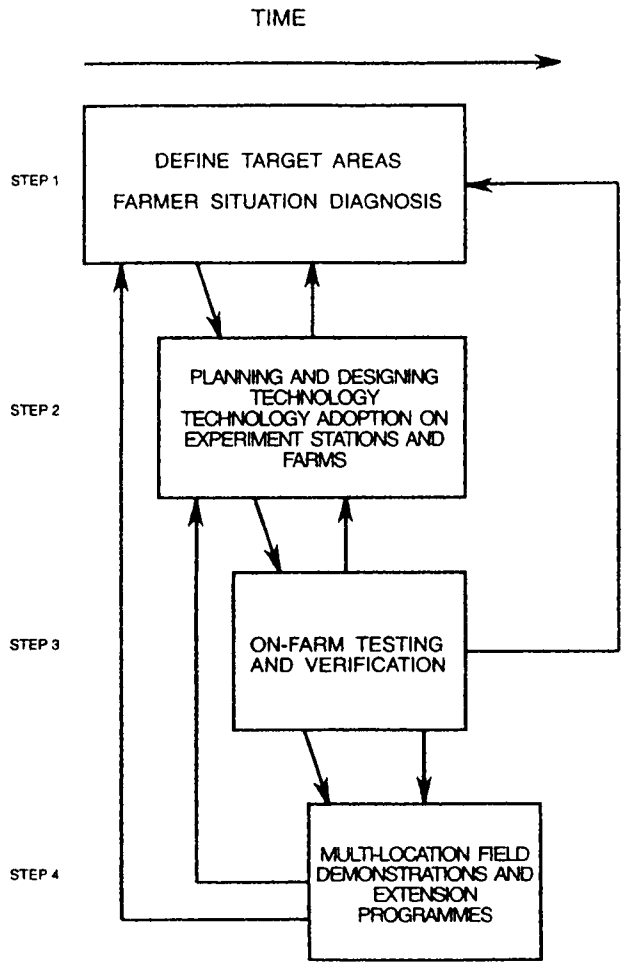


Figure 2.3: Steps in the FSR/E model for developmental and extension of new agricultural technology (Bembridge, 1991)

The extension worker acts as a link between farmers, subject-matter specialists and researchers in all the above steps, particularly Steps 3 and 4 (Figure 2.3). Figure 2.3 illustrates the importance of feedback not only on the usefulness of technology being offered to farmers but also in ensuring that technology is adapted to the specific needs of various target groups of farmers. However, this 'rational', systematic procedure is coupled with sensitivity to the non-technological context of the farmers' cultural milieu (Bembridge, 1991).

The FSR/E model has since evolved into a range of specialised approaches which are perhaps more widely implemented today. It has been expanded to include the all-

important institutional support (FSR/I). However, these specialised approaches all share several aspects of the original model:

- An understanding of the farmers' culture, world-views, needs, and other aspects of their life situation is a prerequisite for collaborative change;
- The farm is a dynamic system which is linked to the total society and to other systems, such as education, marketing and government;
- The farm site is the place where research is practically implemented;
- Research findings generated on the farm with the farmers themselves are adopted and applied by the local people to their farming operations; and
- Interaction among a number of agencies and professionals is desirable; it ensures that a multidisciplinary emphasis is maintained.

As a result of continued contact with farmers and because research and extension are combined rather than separated, communication problems are reduced, and the time lag between defining problems and adopting technology is minimized (Hoffmann *et al.*, 2009).

This is in agreement with Mutsaers (2007) who states that the small farmer is regarded as the focal point and that research with FSR is determined by the special needs of the farmers. The extension workers must first learn from the farmer and must understand his farming system before they can suggest solutions to their problems.

This extension model seems to be an improvement on many of the negative aspects of previous extension approaches. The emphasis placed on consultation with farmers and the strong linkages with research is commended. This should therefore be included in the extension model that will be developed.

2.4.5 United States' Co-operative Extension System

According to Bembrdige (1991), the US Co-operative Extension System (USCES) is an example of a large, successful extension system which has developed within a historical context and with a resource base that may not be available in other countries. Experience has shown that there are difficulties which may prevent other countries from replicating this system:

- USCES has a long history that was preceded by a philosophical commitment to the independent family farm as an embodiment of the nation's spirit. Eighteenthcentury European political philosophy idealized the image of man who is one with nature and viewed the city as a corrupting influence. These notions took root in the emerging United States leading to the establishment of land-grant institutions intended to provide higher-education opportunities for studying agriculture. Congress established agricultural research stations as part of the land-grant institution system. In 1914, the Co-operative Extension Service (recently re-designated the Co-operative Extension System) was set up as the third major function of the land-grant institutions for the purpose of extending instruction in agriculture and home economics to the public. The USCES therefore has had half a century in which to develop, and has had a century in which to mature (Rölling, 1998);

- This pattern of development links the USCES to the educational aspect of the land-grant institutions and the research efforts of the agricultural research stations. These linkages are historically and organisationally ingrained. These would be difficult to accomplish by legislation; and

- Control and funding of the USCES is shared by federal, state, and local governments. The tripartite responsibility leads to a broad organisational structure, constant and immediate accountability, and considerable flexibility in helping people set goals and select programmes. As mentioned before, the administrative pattern too was intensely debated in the political arena over a number of years, and did not emerge overnight.

The USCES might be best considered a model of what can work very well in the context of national commitment to agriculture. It also indicated the benefits of political stability that allowed structure and goals to be developed, over time and through debate and plentiful natural resources.

Although it was stated that other countries would find it difficult to implement this extension system, there are lessons to be learnt from this system. The lessons that one can learn from this system is that strong commitment to agricultural development is a prerequisite, an effective extension system will take a long time to develop, there needs to be strong linkages with educational institutions, the extension system must be viewed as an integral part of a nation's development such that funding the system will not be seen as a burden and there needs to be political stability.

2.4.6 The Agricultural Knowledge and Information System for Rural Development (AKIS/RD)

The general scientific framework used by scientists and extensionists to convey findings of agricultural research to 'users' often follows the linear transfer of technology approach. Agricultural research is seen as the fountainhead of technological innovations and extension delivers these to farmers. This approach assumes that scientist know best, new technology is needed and new technology is better than old (Chambers, 1993; Kline *et al.*, 1986; Röling, 1988; Long *et al.*, 1989; Röling *et al.*, 1997). However, many technologies are usually 're-invented' as it is adopted (Rogers, 1985). What's more, most new ideas do not spring from research, but from practice itself (Kline *et al.*, 1986), as farmers are keen experimenters and researchers.

There are definitely situations where the linear model does apply, but it is by no means a model that can usefully inform all extension practice. Notwithstanding its tenuous interface with practice, the linear model is persistent because it is coherent, logical and simple (Röling, 1995). In the linear model, this framework comprises a sequence of institutions, such as fundamental research, applied research, subject matter specialists, extension workers and farmers, neatly 'calibrated on the science-practice continuum'.

Such an institutional framework is ideally suited to support the flow of innovations from science ('upstream') to innovative users and from them to other farmers ('downstream') (FAO/World Bank, 2002).

Depending upon the situation, different institutional actors play contributing roles to the innovation process. Innovation emerges from the synergy of the contributions of those different institutional actors. Since the 1990s, the Agricultural Knowledge Information System for Rural Development (AKIS/RD) concept emerged as a guiding framework for conceptualizing agricultural knowledge systems (FAO/World Bank, 2002). This concept links rural people and institutions responsible for mutual learning, generation, sharing and utilizing of agriculture-related technology, knowledge and information (FAO/World Bank, 2002).

Some authors refer to agricultural educators, researchers and extensionists as the three pillars of the AKIS/RD system, which harness knowledge and information from various sources for better farming and improved livelihoods. These three pillars are also referred to as the "knowledge triangle" (Figure 2.4) and shift the attention to feedback and upward communication from farmers and facilitating research-extension-farmer-education interactions. The vision underlying AKIS/RD was to establish an integrated approach to agricultural education, research and extension with a view to respond to technological, knowledge and information needs of rural people, to help them to reach better informed decisions on management of their farms and households (D'Haese *et al.*, 2006).

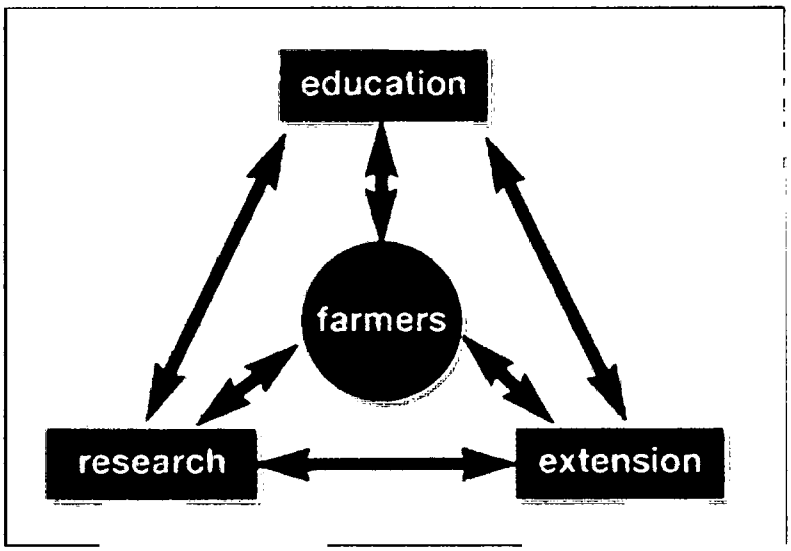


Figure 2.4: Agricultural Knowledge Triangle (adapted from World Bank, 2002)

In Figure 2.4, each sub-system of the agricultural triangle receives in principle relevant information for the other sub-systems and transmits research information and field observations back to the individual sub-system. Farmers are at the heart of the knowledge triangle. Education, research and extension are services (public or private) designed to support the knowledge needs of farmers in an endeavour to improve their productivity, income and welfare through the sustainable management of natural resources. Shared responsiveness to rural people and farmers ensures synergies in the activities of educators, researchers and extensionists. The farmers are perceived as partners within the agricultural knowledge information system, and not simply recipients (Rivera*et al.*, 2005).

Farmers have the capacity in terms of local knowledge, skills and experience to run their farming enterprises productively, profitably and sustainably. Their capacity to do this must be supported by effective linkages with other AKIS/RD stakeholders which:

- Accurately identify constraints and opportunities faced by farmers, and engage scientific methods to generate appropriate and sustainable economic, social and technological responses;
- Help farmers to marshal social skills and technologies to augment their productivity, manage natural resources sustainably and collaborate effectively

with one another in addressing their common problems. This will help farmers to become meaningfully involved with all major stakeholders in determining the process of technology generation and implementation; and

- Provide continuous training and mutual learning opportunities for educators, researchers, extensionists and farmers.

Extension is afforded a significant and broad purpose in the AKIS (Rivera *et al.*, 2005) – one that goes beyond dissemination of agricultural information and technology to include learning. This concept of extension suggests that the extension service be viewed as a non-formal learning system paralleling the formal education system, as well as providing technology and information to farmers.

The fact that this extension system has moved away from the linear approach can be highly recommended. This system has also advanced the ideas of the FSR/E model by including education in its model. Another important aspect that can be commended is that this model has incorporated farmers as central to the system; this can be seen in the Agricultural Knowledge Triangle (Figure 2.4). However, before one can recommend this model as appropriate to service the public extension service in the Eastern Cape, one must first review the new developments in the field of extension science.

2.4.7 Farmer Field Schools

The concept of Farmer Field Schools was developed in the 1980's by the FAO in Indonesia. It was considered to be an effective tool to extend knowledge for farmers (Dontius *et al.*, 2002). The FAO has introduced FFS in Africa in recent years to promote integrated pest management (IPM) (Witt *et al.*, 2008). The farmer field school approach is an adult education method to educate and empower farmers as well as to disseminate information and technology (Davis, 2006). Farmer field schools have shown remarkable impacts in terms of reducing farmers' use of pesticides for environmental and health benefits, increasing their on-farm productivity, improving knowledge gain among farmers, and empowering rural communities (Davis, 2006).

The FFS approach stimulates continued learning and strengthens the social and political skills of farmers. The FFS non-formal education approach has been expanded in sub-Saharan Africa to cover an increasing range of production practices (Davis *et al.*, 2009). The problem with the FFS model is that it is a relatively expensive, labor-intensive extension model that reaches a small number of interested farmers. But to strengthen extension programs to promote natural resource management, the FFS is an important approach (Rajalahti *et al.*, 2005; Amudavi *et al.*, 2007).

Cost is a key drawback for the farmer field school approach and raise problems for financial sustainability (Thiele *et al.*, 2001). The amount of service actually delivered (the number of farmers trained) would be small (Anderson, 2008).

2.5 PREVIOUS WORK ON THE IMPACT OF AGRICULTURAL EXTENSION

Significant work has been conducted in various parts of the world to investigate the impact of extension in its various forms on farmer behaviour, productivity and reducing poverty. Work done by Dercon *et al.* (2008) on the impact of agricultural extension and roads in poverty and consumption growth in Ethiopia showed that 'agricultural extension had a positive impact on productivity, however, the survey could not establish reasons behind the relationship. The kind of information that extension workeres provided which has led to increased production is still to be investigated'.

Feder *et al.* (1986) investigated the impact of training and visit (T & V)method of agricultural extension in India and found out that there was a positive return to investment in extension through the T&V method. Farmers supported through T&Vhad much more knowledge than their counterparts receiving extension through other methods and these farmers also realized higher yields than their counterparts. This shows that there is differential benefit of extension depending on the method used to provide extension service.

Another study conduct by Githaiga (2007) on the impact of common interest group approach to public extension in Kenya showed an improvement in the productivity of farmers from the common interest groups and in particular, the less educated

households had the greatest impact. There was increase in the general living conditions of these farmers. However the greatest driver of change was the increased access to markets which acted as an incentive for farmers to work harder and earn more. The groups were also instrumental in bringing ideas together and sharing of best practices which assisted the least educated farmers to gain practical knowledge already repacked on the local context.

A study by Gemo *et al.* (2005) on Mozambique's experience in building a national extension system found that Mozambique was not able to establish its public extension service until 1987 and because of the ongoing Civil War public extension did not become operational until peace was achieved in 1992. Since 1999-2004 Mozambique has uncritically followed the general prescription of many donors to "free agriculture from the state", outsource extension to the private sector and assume that poor farmers can buy their way out of poverty by paying for the services of private extension workers and thereby reduce the size of the public extension service and public funding of extension. The first Extension Master Plan covering 1999-2004 adhered to this line of thinking and assumed that, over time, the private sector would replace public extensionists and cost sharing would reduce total government expenditure on extension. The challenge for Mozambique is to strengthen the public extension system and to invest in agricultural research with special emphasis on small-scale farmers. The 3.3 million small-scale farms in Mozambique will have a hard time "buying their way out of poverty" by paying for extension services.

2.6 MONITORING AND EVALUATION AND MENTORING AND COACHING OF AGRICULTURAL EXTENSION (M&E)

2.6.1 Monitoring and evaluation

Düvel (2007) states that there is very little monitoring of extension worldwide and feels that the main reason for this is lack of understanding of the concept of monitoring and the appropriate criteria for its implementation

Over the past forty years hundreds of thousands of technicians have been trained and hundreds of millions of farmers have had contact with extension services. Countries now struggle with declining budgets and question the effectiveness of their investment in extension. Many studies have analysed the impact of extension, and in some cases with impressive results, however, challenges with data and econometric difficulties in the analysis suggest that the results should be interpreted with caution (Anderson et al;2004).

According to Kahan (2007) farm management extension and agricultural extension programmes generally do not have well designed monitoring and evaluation systems that report on organisational performance. Measuring the performance of an advisory service is methodologically less demanding than assessing its impact, as impact assessments encounter various attribution problems.

It is the Neuchâtel Group (1999) view that common approaches to monitoring and evaluation of extension activities should be developed. In order to improve the analysis of extension services, clear frameworks should be offered to evaluators of projects with an extension component. Donor agencies could assist in devising common reporting procedures.

According to the Neuchâtel Group (2003) it is not adequate for extension workers to only be accountable to their supervisors within a line department. They contend that good governance in extension is developed from procedures and incentives for extension workers that take into account the views of clients on the performance of extension workers and the extension system.

Düvel (2007) notes that monitoring, or formative evaluation, focuses on gathering information to improve extension delivery in an ongoing and reiterative process. In order for monitoring to be effective and useful, the monitoring criteria should meet the following conditions: (i) Accessible to frequent measuring. Done as extension inputs are made or as soon as possible thereafter. It should be possible to measure or gauge the change. This excludes efficiency aspects such as yield or quality of produce, or other seasonal practices as they can only be assessed once a year; (ii) They should measure

the change that occurs directly, not the indirect results of the change, meaning that the criteria focuses on actual extension endeavours.

In South Africa, evaluation criteria are usually of an input nature, which are valuable to managers when giving account of an allocated budget and controlling inputs in relation to programme plans, however, according to Düvel (2007) this is insufficient as for real accountability, the input costs of extension should be justified in terms of outputs achieved. In this case more emphasis should be placed on output criteria when conducting evaluation. Düvel goes on to say that the appropriateness of indicators as monitoring criteria can be summarised as follows: (i) Society impact: This is the most important impact, especially for politicians as it justifies public expenditure. It is difficult to reliably attribute these changes in impact to changes brought about by extension; (ii) Economic efficiency: These are the most important goals relating to production efficiency which are considered important in agricultural development. In order to effectively measure this, reliable records are required; (iii) Physical efficiency: Aspects such as yield, quality of product and conservation status are of the most commonly used criteria in South Africa. These criteria are measured at the end of a programme or project. They are the cumulative result of a series of practices applied correctly and timeously which can be influenced by external factors such as climate and markets; (iv) Adoption of practices: These practices can usually only be measured once a year, for example, tillage practices, fertilisation, plant density etc., and therefore have limitations as monitoring criteria. These criteria are not influence by external factors and are a more direct result of extension inputs; (v) Behaviour determinants: This refers to influencing farmers' behaviour by their adoption of practices by influencing the behaviour determinants. This excludes independent variables such as age, education, experience, managerial aptitude and farm size, but rather focuses on the following intervening variables: (a) Needs, where need-related causes of non-adoption of recommended practices can be due to a lack of need or aspiration, or a need incompatibility; (b) Perception, where the unwillingness to adopt recommended practices could be as a result of the following: Its insufficient prominence; Unawareness of its advantages; Concern for disadvantages; Situational incompatibility owing to an awareness of constraints preventing implementation; (c) Knowledge, where the

following are relevant to the adoption of the practice or innovation: basic knowledge of principles, knowledge or awareness of the solution, knowledge of the relative advantage, knowledge or skill in respect of the application of the innovation or practice.

It is Anderson et al. (2004) view that many factors affect the performance of agriculture in complex ways, and it is difficult to attribute specific impacts at farm-level to extension services. Farmers' decisions and performance are influenced by many systematic and random effects such as prices, credit constraints, weather and other sources of information. The inability to effectively assess extension impact leads to weak political support, insufficient budget allocation, lack of staff incentives and accountability, resulting in lack of performance by extension managers and poor service delivery to clients. Anderson *et al.* go on to say that evaluating the impact of extension relates to the measuring of: (i) Relations between extension and farmers' knowledge, adoption of better practices, and use of inputs; (ii) Farm productivity and profitability; (iii) Improvement to the farmer's welfare. Extension workers are not held accountable for the quality and quantity of their extension work, while their superiors are nominally accountable for the extension service to the political level, where they are mainly monitored on budget spent. Anderson & Feder contend that farmers are the only ones who can easily observe the quality and effectiveness of the extension services.

It is the Neuchâtel Group (2003) view that in order to understand the impact of technological change on rural livelihoods, the potential of creating opportunities for poverty reduction should be assessed, based on the following entry points: (i) Changes in on-farm production, whether consumed of sold; (ii) Changes in local on-farm employment opportunities; (iii) Changes in migration incentives and opportunities; (iv) Changes in quantity and reliability of staple food and fibre production; (v) Changes in vulnerability, either through sustainability of natural resource management, or with respect to community stability through impact on political, ethnic or social conflicts; (vi) Changes through pro-poor price effects in all of the above through relatively lower food prices, higher wages, increased returns to own-farm labour etc.; (vii) Changes in access to, and the use of, forest and communal property resources; (viii) Changes in access to markets.

The International Initiative for Impact Evaluation (2010) recommend evaluating agricultural extension services as follows: (i) Context: country, location, confounding variables, community characteristics, agro-ecological, climate and weather, baseline input use, and market access. (ii) Intermediate outcomes: knowledge acquisition by farmers, farmer-to-farmer diffusion of knowledge, technological adoption. (iii) Final outcomes: yields, income and changes in poverty status.

According to Christoplos (2010) investment in extension has been justified by claims of important outcomes, although difficult to measure reliably. There is a need for improved evidence, and methods to collect evidence. Extension should be promoted to convince decision makers in government and the private sector that it is a cost-effective agent of economic growth, a prerequisite for rural poverty alleviation, and a basic tool for meeting the challenges of global environmental change. This will only be realised by applying integrated approaches to rural development, which are grounded in learning, exchange and co-ordination.

2.6.2 Mentorship and coaching

The term mentoring is increasingly being misused to mean the same thing as coaching, and vice versa. While mentoring is the process by which a mentor assists the protégé (or 'mentee') to develop their skills and abilities to be the best of what they want to be in life, coaching refers to a process by which the instructor (or coach) imparts specific skills to the student (the coached) to be the best they can be in a specific field, area, discipline or game. In coaching, the target result or standard of excellence is known – e.g. football, tennis and other sports. Obviously there are overlaps, for example, a mentor can do, and usually does, coaching in specific areas, but the two are certainly not synonymous (SCARDA, 2010).

According to Terblanchè (2007) mentorship can be described as a nurturing process in which a more skilled or more experienced person serves as a role model, teaching, sponsoring, encouraging, counselling and befriending a less experienced person for the purpose of promoting the latter's professional and personal development.

Terblanchè(2003) is of the opinion that mentorship should be a life-long process which is a new challenge for extension workers, and that it should include an exchange of knowledge, skills and experience, and an acceptance of mutual responsibilities, while not being prescriptive. He goes on to say that mentors, including equity shareholders, should receive training in mentoring skills. Lonsdale (2008) states that a strategic partner in land reform mentors a person or group of people but is also prepared to risk investing capital and equipment in a joint venture with that person or group in return for a pro-rata share of the profits (Lonsdale, 2008).

Kiewiet (2001) contends that the appointment of mentors to land reform beneficiaries is a necessity. The role of the mentor should be clearly defined, and the mentor should not be seen as a teacher, trainer or boss, but rather nurturing a relationship of mutual trust and openness. Jordaan *et al.* (2009) note that initially government structures were suspicious of mentorship as it was simply a tool of extension, and the intentions of those who proposed mentorship as an extension tool to assist South Africa's poorly performing land reform programme were suspected of own interest

It is Lonsdale (2008) view that mentoring a group is more difficult than a one on one mentoring relationship, as it is more difficult to earn the trust of a whole group. Ensuring that the mentor / mentee(s) relationship is compatible is an important consideration during the planning phase of projects.Lonsdale goes on to say that It is often difficult to find a suitable mentor for a project and this could be resolved by involving organised agriculture to assist in advertising for mentors in their internal correspondence and brochures. Koch *et al.* (2008) found that in the case of the Opppermansgronde, the first partnership between the Oppermans Communal Property Association and Insig Boerdery Venootskap, resulted in the mentor focussing on economic factors such as production and too little on community development and empowerment. This was despite the main purpose of the mentor being to co-ordinate training, train, manage, administrate, market and be responsible for the overall empowerment of beneficiaries to enable them to run the business after three years. Kock *et al.* (2008) experienced that a partnership was not an ideal vehicle for development.

Terblanchè (2003); Van der Westhuizen (2005) both agree that Mentors are required, but when the original owner has equity shareholding with the recipients, they tend to make unilateral decisions that are detrimental to the enterprise, which should be guarded against. Lonsdale (2008) experienced that, despite earlier beliefs to the contrary, former owners as mentors have worked well for some projects. This requires strong community leaders that are knowledgeable and well motivated and have a relationship of mutual respect with the previous owner. According to Gray et al. (2007) successful equity-share projects had the following common features: (i) External audits; (ii) Annual general meetings; (iii) Disclosure of financial statements; (iv) Formal procedures for conflict resolution; (v) Tradable benefit and voting rights assigned in proportion to individual investment.

According to Lonsdale (2008) a strong mentor or prescriptive mentor takes a strong lead in decision making. At the start-up of projects, community members have not yet established their roles in the farming venture, as they are often all farm labourers of equal standing. In this situation, it is difficult for elected leaders to take control and a strong mentor could be an advantage. Lonsdale goes on to say that the timing of agricultural operations is critical to the success of projects. In cases where inputs have been delayed or cancelled, and funds were provided by the mentor to continue as planned, these projects were successful, which highlights the importance of teaching new farmers how to plan.

Lonsdale (2008) recommends that mentorship should be properly planned by supporting institutions and commitments undertaken. Londale contends that Mentors get demotivated when their efforts cannot assist farmers because everything they recommend cannot be implemented due to lack of finance or social problems. According to Terblanchè, (2007) the following obstacles could confront a mentor: (i) The mentor may have a style which is not compatible the mentee's needs and this will lead to frustration; (ii) Working within unrealistic time-frames and expecting too much from the mentee; (iii) The mentee having a hidden agenda; (iv) A mentee that that has an inappropriate attitude and expects too much from the mentor; (v) Mentees demanding more time than they actually need. Terblanchè continues and lists obstacles that could confront the mentee: (i) Peer jealousy, in cases where colleagues do not have a mentor;

(ii) Professional jealousy, in cases where one mentee demands and gets more attention than others; (iii) One party overstepping professional boundaries when the relationship becomes too personal; (iv) The mentor falling out of favour when part of the mentee group no longer approve of the mentor.

Lonsdale (2008) recommends that government puts in place mechanisms to back-up the relationship between mentor and mentee by planning the mentorship programme. He recommends that an external, or neutral internal group, should be appointed who have expertise in the following: (i) Training of mentors and mentees; (ii) Technical advice on equity schemes and legal entities; (iii) Technical advice on financing; (iv) Managing groups to prevent conflict; (v) Conflict resolution, internal to the group or between mentor and mentee; (vi) Creating a paradigm shift where necessary, e.g. veld management; (vii) Planning, record-keeping and reading financial statements. It is Koch et al. (2008) experience that essential criteria for a mentor should include: (i) Ability to work on a full-time basis; (ii) Having farming experience relevant to the project; (iii) Managerial skills; (iv) Co-ordination skills; (v) Administrative skills; (vi) Communication skills; (vii) Liaison skills; (viii) The right attitude to development.

Lonsdale (2008) contends that extension workers already had a full-time job before the introduction of land reform projects. The extension workers' efforts in increasing the yields and the area under production of land reform projects, stretches them beyond their limits. By employing mentors or strategic partners the extension workers' output could be increased substantially. The most important task of an extension worker regarding mentors is to monitor their performance and manage their payment. Koch et al.(2008) concur and state that a mentor's remuneration should be linked to the level of empowerment achieved. Lonsdale (2008) notes that in the case of strategic partners, extension's role is also to ensure that when the strategic partner exits, the beneficiaries are able to continue with the business. Koch et al.(2008) recommend that in cases where the community is not ready to farm on their own within the specified mentorship period, the period of mentorship should be extended, but not for an unlimited period. In their study of small-stock farmer mentoring in the Eastern Cape, Jordaan, et al. (2009) found that more learning took place in the kraal than in the classroom, and that learning was acquired over time and not from one-off training courses.

It is Idsardi (2009) view that government funded projects such as the Comprehensive Agricultural Support Programme (CASP) should have a continuing monitoring system with re-alignment where necessary, and that mentors could carry out this task.

2.7 AGRICULTURAL INNOVATION SYSTEMS

The agricultural sector changes quickly and is multifunctional. To achieve social, economic and environmental goals, one can use innovation as an essential strategy (Klerkx *et al.,* 2009). Swanson *et al.*(2010) define innovation as any new way of doing something and these range from methods to produce new products or changes in thought patterns or the use of new procedures or products. It can also include institutional innovations whereby an organization performs new or different functions.

Often developing countries use agriculture as a central element of their economical activities and innovation is a key to reduce poverty through sustainable agricultural growth (Thomas *et al.,* 2006). There is also a shift away from the linear approach used by public sector extension to disseminate innovations or technologies. Public sector extension is reforming or shifting towards a systems approach whereby innovation is born from a process whereby a heterogeneous set of actors network, negotiate and learn interactively (Leeuwis, 2004). This systems approach also recognises that innovation is not only about the adoption of new technologies as it requires a balance between new technical practices and, new and alternative ways of organizing, for example, labour, land tenure, markets and distribution of benefits (Dormon*et al.,* 2007).

Systems thinking within agricultural innovation have evolved through several extension approaches such as Farmer Field Schools, agricultural knowledge and information systems, the Farmer First movement and the Australian Landcare movement (Klerkx *et al.,* 2009). This has led to the concept of agricultural innovation systems (AIS) (Röling, 2009). The World Bank (2006) has defined a national AIS as: "a network of organizations, enterprises and individuals focused on bringing new products, new processes and new forms of organization into economic use, together with the

institutions and policies that affect the way different agents interact, share, access, exchange and use knowledge."

National AIS is more than just researchers, extension workers and farmers as it includes different actors from the public, private and civil sectors. This would include, for example, actors from the value chain, marketers of agricultural produce, retailers, consumers, policymakers and NGO's. If a specific innovation is needed, innovation networks that are flexible and dynamic can be formed from the actors present in the national AIS. Although it must be stressed that innovation requires multi-actor involvement, the AIS approach recognises that institutions (i.e. regulations, laws, practices, incentives) have an influential role in shaping how actors interact (Klerkx*et al.,* 2009).

Innovation systems are more than just knowledge creation, exchange and use as it needs to fulfil other functions that are central for innovation. AIS's other functions include vision development, fostering entrepreneurial drive and activity, market formation, resource mobilization, making change legitimate and overcoming resistance to change (Hekkert*et al.,* 2007). For AIS to function effectively in developing countries, there is a need for shared vision, well-established linkages with information flowing between the different actors, well-developed human capital, adequate legislative, policy and market environments, and incentives to enhance cooperation between the different actors (Hall*et al.,* 2001). However, the creation and encouragement of effective linkages can be hindered by differences in technology, socio-economic conditions and cultural divides (Klerkx, *et al,* 2009). A study on AIS conducted by the World Bank (2006) found that linkage formation was extremely limited even when there were strong incentives.

In developing countries especially, it has become apparent that intermediary organizations are needed to connect the different actors in the AIS, build appropriate linkages and facilitate multi-stakeholder interactions. These intermediaries are termed innovation brokers. There have been cases of innovation brokers from the public sector who have been unable to fulfil their systemic intermediary role effectively (Klerkx*et al.,* 2009). If this is the case, then an innovation broker – that is mutual to all the actors – is

needed. According to Van Lente *et al.*(2003), innovation brokers have three main functions, these are:

1. Demand articulation of innovation needs;
2. Facilitating linkages within the AIS network; and
3. Managing the innovation process.

2.8 THE CHANGING FACE OF EXTENSION

Agricultural extension is changing in two ways, namely changes in extension practices and changes in the extension organization. Both of these will be discussed below.

2.8.1 Changes in the way extension is practiced

The agricultural and extension environment has changed and so, extension practices need to change. In the past, extension focused on supporting individual farms, but today's challenges (globalization, sustainable natural resource management, value-chain management, marketing, etc.) require collective action – not only from farmers and extension workers – from all actors within the extension environment. This requires a shift in conceptual paradigms of what extension is about, the type of organizations needed and the type of people doing it (Leeuwis, 2004).

Another change in the new paradigm of extension is the idea that promoting pre-defined innovations to farmers is inappropriate as there are no simple and uniform solutions for agriculture under highly diverse natural and socio-economic conditions. Sustainable agriculture requires tailor-made innovations for local conditions and these emerge when various stakeholders interact. Thus the new paradigm of extension requires managing the innovation process rather than technology transfer or dissemination (Leeuwis, 2004).

In line with appropriate innovations, part of the Alliance for a Green Revolution in Africa's (AGRA) revolution involves building on the principle that food security is best achieved when agricultural research is integrated with appropriate technologies for

small-scale farmers (Annan, 2010). Very little appropriate research is undertaken to improve the livestock and crops produced by the small-scale farmers under these difficult situations. The same applies for innovative ways that could bring about efficiency and effectiveness in the manner in which farmers conduct their activities. Through appropriate research in traditional crop and livestock production for these farmers, economic opportunities can be created to enable the farmers to diversify into value-adding activities and thus improve their income levels (Mokoene, 2007).

Beyond appropriate innovations, leading universities that specialise in extension, such as Wageningen in the Netherlands, have renamed their field of Extension Sciences to Communication and Innovation. Studies agree the name "extension" to be paternalistic and was patronizing to the farmers concerned as it represented a "so-called enlightened" person trying to enlighten those deemed to be unenlightened. Previously, extension involved transferring logically-based scientific innovations that supported government policy and not what farmers necessarily wanted or needed (Leeuwis, 2004).

Thus the definition of extension, under its new name of "Communication for Innovation" means extension (the old name will still be used to avoid miscommunication) activities that are "a series of embedded communication interventions that are meant, among others, to develop and/or induce innovations which supposedly help to resolve (usually multi-actor) problematic situations" (Leeuwis, 2004).

According to Acunzo *et al.* (2010), agricultural extension has changed from the transference of technologies and diffusion of research to a process known as communication for innovation. The latter aims to involve multiple stakeholders and has five steps:

1. Encourage people to identify and acknowledge a problem;
2. Identifying and collecting together the different stakeholders that are affected by the said problem;
3. Working with stakeholders to define ways to affect change, while enhancing the existing communication patterns;
4. Addressing the societal cost of creating the change; and

5. Critically evaluating and reviewing the change and process.

Communication for Innovation also involves Agricultural Innovation Systems (AIS), which are a network of enterprises, organizations and individuals that have a focus on bringing new products, services, processes and/or organizations into being economically useful, as well as institutions and policies to effect innovations. In light of innovations and small-scale farmers, innovations are not necessarily new technologies, but rather innovations from farmers who have innovated successfully, with this type of innovation being communicated to other farmers so that they can adapt and respond to market demands (Swanson *et al.*, 2010).

The extension organization has an inclusive role to play in a country's AIS as it needs to include different institutional linkages and actors involved in the extension environment as this will strengthen the AIS. It may even be necessary that strategies be developed to strengthen linkages with the other actors (research, universities, private-sector companies and NGO's) so that their roles and contributions will enhance a country's AIS (Swanson *et al.*, 2010).

Leeuwis (2004) propose that extension organizations' new role is to "manage communication in processes that are somehow aimed to bring about new patterns of co-ordination". These processes are in relation to network building, social learning and negotiation.

2.8.2 Changes in the extension organization

Agricultural extension services have evolved from their humble beginnings. Organizational changes that have occurred can be grouped into four categories, although these four categories can be used simultaneously. These four categories are:

1. Decentralization;
2. Market-orientated extension;
3. Pluralism; and
4. Bottom-up or participatory extension.

It has been found that in many cases government extension has become irrelevant and, NGO's and private commercial extension has surpassed the government's role. Having said this, governments still have an important role in funding extension and advisory services as it is not always financially viable for the private sector. Governments also have a critical role in establishing infrastructure that supports farming, such as markets and communication (Rivera*et al.*, 2001).

According to Hoffmann *et al.* (2009), the era of public finance of extension is coming to an end in most countries and that when it is in the public interest and therefore deserves public finance the provision should be private.

Trends of extension reform from governments around the world follow two directions or a combination of both depending on the specific situation. The two directions of reform are market reforms and non-market reforms. Market reforms are when the government privatises the extension organization, while non-market reforms involve decentralization. This is whereby National governments relieve themselves from the responsibility of managing and funding extension activities. This responsibility is given to provincial governments, municipalities or NGO's (Rivera*et al.*, 2001). In a pluralistic extension system, there are many different organizations at work, operating in different problem areas and with different client groups and pursuing different objectives with their extension services. As there is a mixture of public and private interest there is a mixture of different sources of finance for extension work (Hoffmann *et al.*, 2009). In South Africa, both types of reforms are common. Large scale commercial farmers' public extension services have been withdrawn and the gap has been filled by private consultants and agribusinesses; thus one can say that for these farmers, extension has been privatised. Small-scale and communal farmers, on the other hand, still obtain public extension services – although these services have undergone decentralization. It must be stated that this is a simplistic view, but the point was to highlight the current situation.

According to Rivera*et al.*(2001) – with the market and non-market extension reform options in mind, which is applicable to the context of a specific area or country – there

are several extension reform strategies that are within several international organizations' vision. These are:

- Promoting pluralism, and specifically pluralistic partnerships with an emphasis on partnerships with farmer organizations and the private sector;
- Cost-recovery schemes, depending on applicability and with provisions in contracts to protect farmers from unproductive or inappropriate advice;
- Decentralization, with responsibility within the lower tiers of government and with the potential for these lower tiers to be given some form of tax-raising powers; and
- Farmers and farmer organizations having subsidiarity.

These strategies do not include privatization as these strategies are aimed at improving extension so that the livelihoods of low-income farmers are improved, with subsequent food security and poverty alleviation. Governments in low-income countries or dual economies – that have low-income farmers – need to make provision for and develop small farmers as it is the responsibility of governments and not the private sector, although they should not be excluded from participating in the extension environment (Rivera *et al.*, 2001).

According to Gabathuler*et al.* (2011), governments should decentralize their extension responsibilities to lower tiers of government, while maintaining a "balance of power". They should also promote the private sector, which can develop farmer organizations around their specific sphere of interest. This will entail a balance of powers throughout the different tiers of government, between the private and public sector, and between farmer organizations and government.

The Neuchatel Group – an informal working group of European institutions on extension activities (replaced by Global Forum for Rural Advisory Services) – is promoting market-orientated agricultural advisory services (MOAAS). MOAAS includes a highly diverse range of services to all of the participants in the value chain. The Group believes that to retain viable livelihoods, small farmers must focus on production for the market instead of focusing on production for home consumption and occasional sales of surpluses.

They state that many of small farmers' constraints are related to an inadequate understanding of markets and economic opportunities (Chipeta *et al.*, 2008).

According to Chipeta *et al.*(2008), the MOAAS does not focus specifically on helping farmers, but rather all the stakeholders involved along the whole value chain. This is due to the fact that although farmers can be producing sufficiently, if the value chain is not functioning efficiently then farmers will not be able to sell their products or they will receive low prices. Thus, all the stakeholders in the system are engaged so that the whole system is running efficiently and optimally.

Another change in the extension environment is the use of public funds to pay extension workers in the private sector. This arrangement is still relatively new and more attention will need to be placed on research and development of this arrangement. One thing that is already determined for the success of this arrangement is the ability of the public sector to manage its contractors as well as to identify appropriate roles for these different actors in the extension environment (Christoplos *et al.*, 2000).

According to Swanson *et al.* (2010), with public, private and NGO's in the extension environment, one needs to identify who is best suited to deliver extension and achieve the goals of extension. There are issues regarding these types of extension organizations and which one should be strengthened, these issues are:

- NGO's are not sustainable in the long term as once funds are depleted, they move onto other activities;
- Private companies are better suited to long-term sustainability as there are financial incentives from supplying inputs; and
- The public sector can be transformed and strengthened into a decentralized, market-orientated and farmer-led extension organization – thus becoming more effective – if government is willing to fund this in the long term.

One of the problems faced in Africa is that governments stopped investing in agricultural research and development when the private sector was unwilling or unable to do this task (Annan, 2010). In most developing countries, governments are aiming at reducing public expenditure. This has placed an expenditure ceiling on agricultural extension and

in some cases, fee-based schemes have been introduced. This can be positive as the clients can dictate or influence the quality and type of services they purchase. This can also be negative as the poorest of the poor may not be able to afford such services (Pesche *et al.*, 2007). Part of the Comprehensive Africa Agriculture Development Programme (CAADP) asks that African governments use a minimum of 10% of their National budgets on Agriculture (Annan, 2010). Hopefully this will halt the trend of reducing public expenditure for agricultural extension.

According to Pesche *et al.* (2007), new approaches to extension are needed. These include:

- Sound agricultural policy;
- Acknowledgement that extension is facilitation as much as it is technology transfer;
- Farmers are clients and stakeholders rather than beneficiaries of extension;
- Market demands are stimulating new relationships between the private sector and farmers;
- Fresh perspectives are needed for public spending and private extension; and
- Pluralism and decentralised activities need coordination between the different extension actors.

According to Swanson (2008), over the past 20 years extension has changed from being technology transfer for increased production to improving rural livelihoods in order to reduce poverty and food insecurity. This will be achieved by four broad objectives, namely:

1. Technology transfer;
2. Human capital development of farm households;
3. Social capital development through farmer organizations; and
4. Sustainable natural resource management.

In India, as in South Africa, their Department of Agriculture had line departments for each type of commodity (e.g. crops, animal, horticulture and fisheries) and these line departments were from national level down to village level with each line receiving

funding for programs from national level. This arrangement helped them achieve national food security during the period from 1975 to 1995, but this arrangement did not help small-scale and women farmers to intensify and diversify their farming systems, and subsequent increases in farm income (Swanson *et al.*, 2010).

Thus the government decided to integrate research and extension from the different line departments such that a systems approach was followed. These were incorporated into a semiautonomous development agency known as Agricultural Technology Management Agency (ATMA), which could be funded both publicly and privately. ATMA followed a bottom-up approach with farmer participation in program planning. It was also decentralised and followed a market-orientated extension approach. Other stakeholders within the agricultural environment – such as NGO's, parastatals and private sector companies – were also involved in ATMA. Thus, ATMA followed a systems approach as all the line departments were integrated with all the stakeholders within the agricultural environment. One of the great successes of this approach was the 250-odd innovations – which entrepreneurial farmers had developed – that could be disseminated to other farmers (Swanson *et al.*, 2010). ATMA is an example of another change that is occurring in agricultural extension (Figure 2.5).

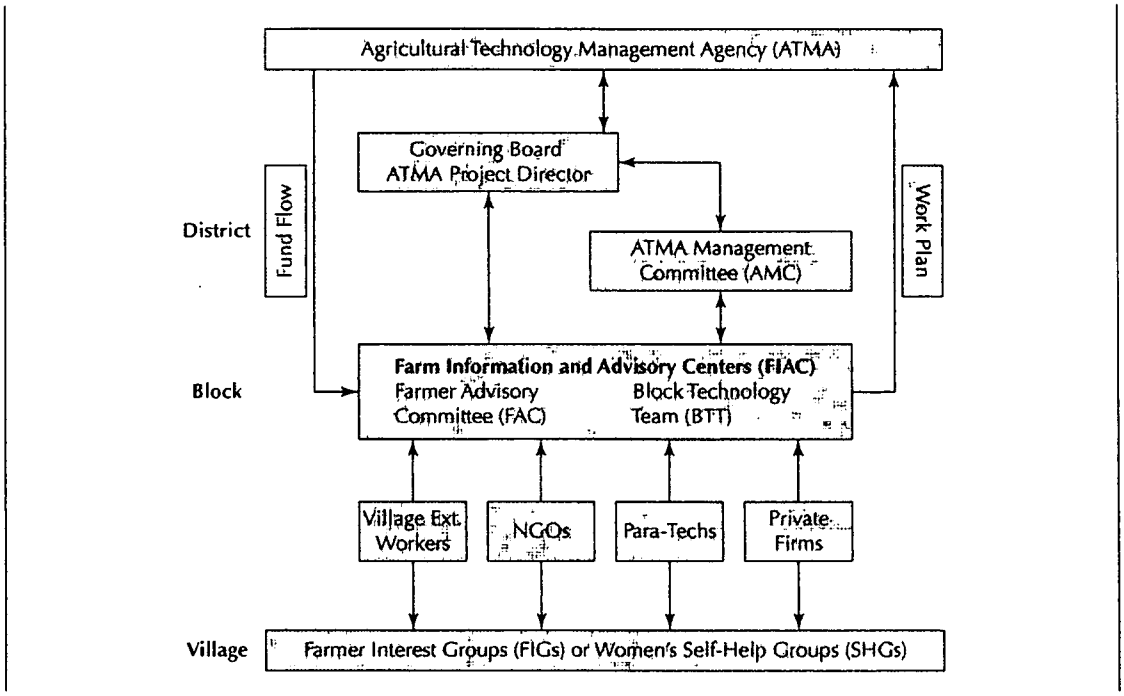


Figure 2.5: The Decentralized Agricultural Technology Management Agency (ATMA) in India {After Singh, Swanson & Singh (2006) In Swanson, *et al,* 2010}.

In Asia, the World Bank has provided strategic investment into public extension organizations that are willing to strengthen their organization through decentralization, market-orientation and farmer-led extension. This new model should, however, be tested on a pilot basis so that it can be fine-tuned before being implemented nation-wide. Governments must also be willing to finance this new model in the long term (Swanson *et al.*, 2010).

According to Swanson *et al.* (2010), the ATMA model was tested in 28 Districts and had a variety of positive impacts, these include:

- Farmers became empowered; 27 000 farmer groups were organised and with this, farmer leadership and organizational skills were developed and farmers started to directly influence extension priorities and programs;
- There were substantial increases in agricultural diversification;
- Areas planted to cereal crops declined, but yields increased without a significant decrease in cereal production; and

- Farm incomes – under this model – increased more than incomes under the conventional model.

The model is judged by many as a major success in extension reform. After a modest beginning in a few states, it has by 2006 been adopted in some 60 districts, about 10% of all in India over just 5 years (Anderson, 2008).

2.9 EXTENSIONAND RESEARCH FOR DEVELOPMENT

Extensive empirical evidence in developing regions have shown that agricultural research and development (R&D) have greatly contributed to economic growth, agricultural development and poverty reduction over the past five years (Beintema *et al.*, 2011).

The Global Conference on Agricultural Research for Development (GCARD) identified the changes required in research and innovation systems so that millions unreached resource poor smallholder farmers and consumers can benefit from environmentally sustainable productivity growth and improvement in systems that can increase their food security and incomes to fight the causes of rural poverty (GCARD, 2010).

The GCARD is organized by the Global Forum on Agricultural Research (GFAR), in association with the reform process of the Consultative Group on International Agricultural Research (CGIAR). In order to reach the Millennium Development Goals the GCARD process is reshaping agricultural innovation. With contributions of thousands of stakeholders they have created the GCARD Roadmap which highlights the changes requires in Agricultural Research for Development (AR4D) systems globally. The Roadmap aims to mobilize agricultural knowledge and innovation towards meeting agriculture and food-related developments needs. The GCARD Roadmap proposes a six-point plan for transforming agricultural research for development around the world, requiring actions from all those involved in the generation, access and use of agricultural knowledge (GCARD, 2010). The six-point plan is: "The need for collective focus on key priorities, as determined and shaped by science and society; the need for true and effective partnership between research and those it serves; increased

investments to meet the huge challenges ahead and ensure the required development returns from AR4D; greater capacities to generate, share and make use of agricultural knowledge for development change among actors; effective linkages that embed research in the wider development context and actions enabling developmental change; better demonstration and awareness of the development impact and returns from agricultural innovation" (GCARD, 2010).

In the past, extension relied on a linear and vertical technology transfer model. This involved researchers creating new technologies and transferring these – via extension workers – to farmers. Extension's linkages with research have, over time, been weakened. Even if these linkages were strong, this one-way technology transfer model is no longer viable, especially within agricultural innovation systems (Christoplos, 2010).

Extension organizations are now using a multitude of sources – which includes small-scale farmers – to access and share knowledge. Rural innovations result from combining different sources of knowledge as well as interactive learning within specific localities, market chains and national innovation fora. Research now goes beyond production techniques to include farm management, processing knowledge and skills, income generation, access to credit and subsidies and nutrition (Christoplos, 2010).

According to Christoplos (2010), with this new approach to agricultural research for development, greater attention is given to the farmers' – including small-scale farmers – own innovation processes. There is a need to understand and respect the various aspects of innovation as well as the ways that extension and research interact through:

- Joint multi-stakeholder problem identification;
- Interactive learning;
- Multiple entry points for assessment; and
- Wider processes for increased impact.

Extension organizations and research institutions need to develop more effective partnerships and pathways with small-scale farmers and their farmer groups so that there is a greater impact on the livelihoods of the poorest. This is slowly starting to happen as researchers are using participatory extension approaches more often than in

the past, although there is weak accountability of research to farmers. This is due to there being few mechanisms in place to force researchers to pay attention to what small-scale farmers actually have to say. For research to be effective in improving small-scale farmers' livelihoods, farmers should have forceful influence and representation in fora where research priorities are made (Christoplos, 2010). There is also a need for international partnerships between researchers and universities to exchange new research to the benefit of small-scale farmers (Harder *et al.*, 2007).

For extension and research to have a wide-scale impact and sustainability, there will need to be an active and respectful relationship between these two institutions. The research-extension-farmer triangle should be built upon, such that it transcends this relationship to a point where market-orientated, risk aware, decentralized and farmer-owned extension networks are institutionalized. Extension can – and should – create opportunities whereby a broad array of actors are brought together to develop agricultural innovations. Extension must ensure that the needs and challenges of small-scale farmers are not overlooked in the participation of new innovation systems (Christoplos, 2010).

2.10 FACTORS SUPPORTING EFFECTIVE EXTENSION

Communication forms the basis on agricultural extensionactivities. Other crucial elements that support effective extension include developing the extension organization and subsequently, developing the human capital within the organization (Van Niekerk *et al.*, 2009).

2.10.1 Communication as the basis of agricultural extension

In terms of agricultural extension, communication can be defined as 'the meaning and results of a flow of information'. These results include changes in attitude, increases in farmers' knowledge and skills level, changes in farming practices and increased production and profitability per unit of area (Woods, 1983).

Effective communication is the key to successful agricultural extension. Both extension workers and farmers are continually making decisions that may affect the success of farming. These decisions are made upon specific information available. Extension communication comprises a process that starts with the sending of a message which is beneficial and acceptable to farmers by a skilful extension agent (communicator). These messages should be communicated through communication channels which will reach the farmer, and the message needs to be expressed in such a manner so that it will be understood by a specific audience or group of farmers who can use the message and will respond in finally adopting the knowledge or practice (Leagans, 1961). Figure 2.6 shows the SMCRE model of communication.

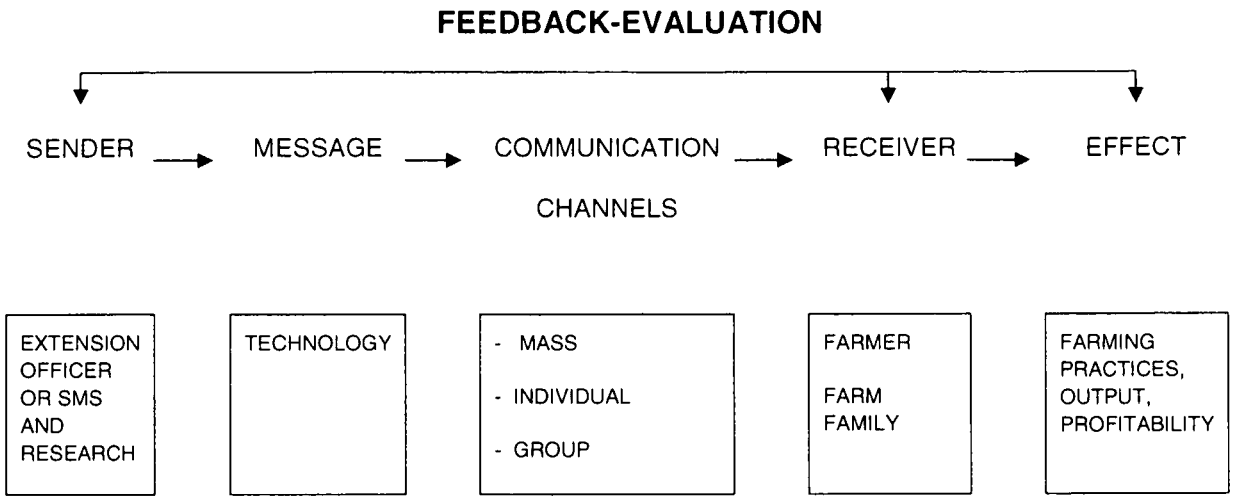


Figure 2.6: The SMCRE model of communication (Rogers *et al.*, 1971)

The model in Figure 2.6 is a very simplistic view of communication as applied in agricultural extension.

2.10.2 Organizational development in agricultural extension

Organizational development within agricultural extension organization requires mechanisms for training extension personnel, institutional support with technical information and skills, factors surrounding financial support and factors relating to staffing. The importance of these factors will be discussed below:

- Rivera*et al.* (2001) state that pre-extension education and in-service training are essential for an effective agricultural extension system. The agricultural environment is ever-changing, with phenomena such as global warming and globalization, and extension workers need to stay up to date with current trends so that their farmers can make decisions – with subsequent strategies – regarding their future;
- Institutional support consists of technical information and skills training for extension workers. Support is supplied firstly by the extension organization as well as by universities, colleges, the Agricultural Research Council, cooperatives and by national and regional government agricultural departments. There are a variety of proposed agricultural development programs in South Africa. Although

a variety of programs exists there is insufficient support that would facilitate such programs. Relevant research is needed and should flow to extension workers so that they in turn can pass this information to farmers (Lategan *et al.*, 2006);

- Bembridge (1991) agrees that for effective extension to occur, there should be financial support and a strong commitment from the government; and
- The agricultural support system, which comprises training; research and extension, can ultimately be covered under the umbrella of staffing or people who would do these three tasks. In the Eastern Cape Province and also in South Africa agricultural support systems are unable and inefficient in their responses to fulfilling the needs of rural communities as well as responding to challenges imposed by NEPAD (New Economic Partnership for African Development) objectives and the global market (Lategan *et al.*, 2006). This problem could be solved by increasing the number of staff within the agricultural support systems and also their effectiveness and efficiency with training, research and extension.

2.10.3 Human capital development in agricultural extension

Human capital development involves increasing the capacities of the (a) role players and professionals within an organization; and (b) all HC dimensions within the broader support system. With regards to the extension organization, this type of development refers to the personal characteristics of the extension worker, leadership and mentoring ability, community cooperation and networks, and communication; these are discussed below (Van Niekerk *et al.*, 2009):

- Jibowo (2008) has identified various challenges that need to be overcome for extension to be effective. These challenges have a bearing on the personal characteristics of extension workers and how they perform their duties. Some of these characteristics that could negatively influence the effectiveness of extension include poor motivation and commitment on the part of the extension workers. This is in agreement to the work of Terblanché (2005), who stated that in order for extension workers to be effective, they must become part of the community. Such integration into the community is achieved by effectively

exhibiting extension-effective personal characteristics as well as becoming a technical expert in a specific field of study. This builds credibility within a community and thereafter the extension worker can start to participate;

- Lansdale (2008), states that leadership is a nurturing process whereby the knowledgeable extension worker befriends, encourages and teaches farmers. This is performed for the purpose of promoting the development of the farmer and farm;
- The philosophy behind agricultural extension is to get farmers to help themselves. In order to achieve this, one needs to study and analyze the rural situation. This includes community structures and leadership. One would need to make a list of formal leaders, local farmer organizations, influential persons, opinion leaders and potential leaders (Bembridge, 1991). It should also be remembered that established groups exist within communities and these groups have leaders who can have a significant influence over the other members. Groups also have a reason for their establishment, such as all the members being maize farmers (Terblanché *et al.*, 2000; Stevens *et al.*, 2004); and
- It has been estimated that in all extension-related organizations in sub-Saharan Africa, 75% of the 150 000 extension workers are not in possession of university degrees and while most have training in technical agriculture, they have not been trained in the human aspect of agriculture, such as communication. This has contributed in part to the ineffectiveness of the extension service (Jordaan*et al.*, 2003). Well-developed communication skills form an integral part of professional behaviour that extension workers are expected to exhibit. It is one of many competencies that extension workers need to develop in order to be effective at the task at hand and thus also satisfying an innate-human need (Stevens, 2007). According to Dagada *et al.*, (2007) all aspects of agricultural activities require communication with people. Communication can be with farmers, farm managers, farm labourers, cooperative members, extension workers or any other affected party.

According to Van Rooyen's *et al.* (1998) Human Capital Matrix (Table 2.1) there is a wide array of actors involved in the agricultural environment that play different roles in developing human capital products.

Table 2.1: Human capital matrix

Human capital products		Specialists							
	Description	**Farmers**	**Extension workers**	**Subject matter specialists**	**Farm systems researchers (FSRs)**	**Applied scientists**	**Basic scientists**	**General Scientists**	**Politicians, policy-makers, planners & administrators**
8	Public choice dimension	XXX	X	X	X	X	X	X	XXX
7	General science						X	XXX	XX
6	Pre-invention germ-plasm				X	XX	XXX	XX	X
5	Agricultural invention			X	XX	XXX	X	X	
4	Sub-invention	X	X	XX	XXX	XX			
3	Information communication	XX	XXX	XXX	XX	X			
2	Technology choice decisions	XXX	X	XX	X				
1	Farm management decisions	XXX	X	XX	X				

X = weak linkages; XX = necessary linkages; and XXX = strong and important linkages

Source: Adapted from Evenson (1988)

In table 2.1 of the Human Capital Development Matrix, each product is an essential and productive outcome or result of the HCD process above it. The various specialists and role players central to each of these products are listed horizontally i.e. farmers, extension workers, Subject Matter Specialists, Farm System Researchers (FSR's), Applied Scientists, General Scientists and public agents (Evenson, 1988; Van Rooyen *et al.*, 1998).

This provides for a holistic matrix-view to enable a systematic approach with the consideration of changes of the agents and the restructuring of current HCD systems, operating in a particular environment, country or region. The HCD matrix provides a comprehensive framework to systematically assess and locate new activities and required changes in the HCD system under consideration. Where, for example it is too expensive to produce particular germ-plasm, basic or strategic research, it will be important to ensure the necessary linkage and partnerships with such HCD producing institutions.

2.11 SMALL-SCALE FARMERS

South Africa's past institutional and legislative framework has contributed to the dual nature of its agricultural sector. The commercial sector comprises mostly large-scale producers, who are mainly of European descendancy, whilst the subsistence sector comprises the small-scale producers who are largely black Africans (Development Bank of Southern Africa, 2005). Small-scale producers are faced by a number of constraints such as a lack of access to productive resources (land, capital) and barriers to enter the market place.

Developing countries have often missed many opportunities for increased agricultural productivity and this has been a costly mistake. This is due to an emphasis on the notion that large-scale farming is superior. Peasant or small-scale farming has been considered an inadequate foundation for development. A commonly held view in these countries was that, owning to their commitment to subsistence, small farms produced a highly variable level of marketable surplus, thus imposing risks upon consumers and the state. Large-scale farms - on the other hand - were believed to produce a more reliable flow of marketable surplus and were therefore reliable. Small farmers were considered subsistence-minded and restricted by such factors as tradition, fatalism, lack of innovativeness, low aspirational levels, limited time perspective and lack of deferred gratification (D'Haese *et al.*, 2006).

According to Reardon *et al.* (2009), retail companies follow a hypothesis – which is theoretically ambiguous – in choosing agricultural goods from large farmers instead of

small-scale farmers. This concerns small farmers' choice of participation in the value chain, for the following reasons:

- Small farmers usually have less wealth and are thus more sensitive to risk. The risk differential between the market channels is not obviously a priority; a contract could make risk lower, but use of new production technologies could make risk higher;
- Small farmers may face higher cost of access to capital but lower price for own labour; and
- Small farmers may have sufficient non-land assets to meet the value chain's requirements, but lack individual economies of scale. Yet small farmers may compensate their small individual scale by using collective scale, such as cooperatives.

Although there are theories that promote large-scale commercial farms over small-scale agriculture, as economies of scale will push small-scale farmers out of the market, this has been refuted. India has over 600 million small-scale farmers and these farmers are unlikely to stop farming in the foreseeable future. Small-scale farmers should therefore be encouraged to increase productivity so that the demand for food – which is set to double by 2050 – can be met (Christoplos, 2010).

According to Annan (2010), Africa's food security problems can be solved by partnerships with small scale farmers. He further advocates farmer organizations as it frees small farmers from their dependence on profiteering middle men as well as giving farmers access to storage, credit when necessary and information on market prices.

According to the GCARD Roadmap (2010), productivity of smallholders farmers can be improved by giving attention to many contextual factors required, including enabling policy environment, good governance, institutional and human resource capacity, capital investment for trade, infrastructure, finance mobilization of farmer and community entrepreneurship and management of related risks, all of which impact on agricultural production.

Small farmers in traditional agriculture are poor but efficient. These farmers remain poor because they have to contend with lack of technical and economic opportunities to which they can respond. If these constraints could be removed these farmers will be generally capable of making rational economic decisions (D'Haese *et al.*, 2006).

Van Rooyen *et al.* (1987) group the constraints facing smallholder farmers into the following categories, namely: system constraints, allocative constraints and environmental-demographic constraints.

2.11.1 System constraints

- Natural risks affecting farming in general;
- Limited supply of marketing services;
- Poor physical and institutional infrastructure;
- Inappropriate legislation and policies;
- Restrictive administrative and social structures;
- Constraints associated with land tenure; and
- Constraints associated with the acquisition of agricultural resources.

2.11.2 Allocative constraints

These are those factors which directly affect the farmer in optimizing decision-making, which the farmer has some control over. These include:

- Liquidity problems;
- Labour shortages; and
- Lack of skills, knowledge and education.

2.11.3 Environmental-demographic constraints

In South Africa, a new class of 'resource-poor' farmers has emerged as a result of rapid population growth and declining farm size. Resource constrained farmers are often

forced to adopt practices that amount to ecological suicide, which has led to land degradation taking on alarming proportions. Population growth has overtaken traditional cropping and livestock practices as population pressure outdates traditional practices in maintaining the productivity of the land. A set of reforms are required which include land tenure, new inputs, and new production technologies (D'Haese *et al.*, 2006).

This role can be filled by the public sector's agricultural extension service. This does, however, needs to be viewed within the context of the overall situation of one's country, and the needs of farmers. With the advent of globalization, the need to bring about equity within the sector (uplifting of black farmers), while the information needs of farmers have become more diverse, and there is a greater pressure on farmers and on extension services (Mokoene, 2007). Small-scale farming still faces challenges that constrain their full participation in the mainstream agricultural sector. One of the reasons attributable to this situation is the years of deliberate under-investment, in amongst others, basic infrastructure in the developing areas by previous governments. We are therefore confronted with the legacy of black farmers who are operating on smallholding, producing less, marketing less and earning less income (Mokoene, 2007).

Many small-scale farmers operate on smallholding and on soils with low agricultural potential. Consequently, productivity is very low further making it difficult for farmers to make out a living from agricultural activities. Efforts by government to address these imbalances through the Land Reform Programme have so far yielded modest results. Both the LRAD and Restitution sub-programmes are marred with problems. It is only when small-scale farmers have access to higher agricultural potential land that their livelihoods can begin to appreciably improve.

Agricultural extension service is very important in improving the status of agriculture in this country. One challenge facing extension service is that the present skills base of technical staff does not match many technological and policy changes that have taken place locally and internationally. This places the small-scale farmer at a great disadvantage, as he/she cannot be serviced by an effective and efficient extension service. Many small-scale farmers do not have their own transport. They mostly rely on public or friend's transport. Where there are prospects for hired transport this is made

impossible to access due to small volume of produce which does not make it financial justifiable to opt for. In addition, the bad conditions of roads discourage transport contractors to assist farmers in deep rural areas (Mokoene, 2007).

According to Swanson *et al.*(2010), small-scale subsistence farmers are the largest and most difficult group of farmers for extension workers to reach. Firstly, these farmers have little education and they may not have great self confidence to look for new opportunities on their own. Communicating with them about new possible enterprises can be difficult as their knowledge is limited concerning new enterprises and they probably cannot properly assess the feasibility of new enterprises as they lack the technical and managerial skills needed. Secondly, many small-scale farmers have small and marginal land resources that are often far from infrastructure. These factors can significantly reduce these farmers' available options.

Thirdly, due to limited physical and economic resources, these farmers are often risk averse to trying new innovations or enterprises. Labour resources are often underutilized too as family members can be mobilized to produce high-value products or they could get involved in the value-adding process. To get small-scale farmers to try new enterprises or innovations, extension strategies will need more than just transferring technology and disseminating information. Extension strategies will need to include informal education activities to create awareness of new opportunities and how these can be integrated into their existing farming systems (Swanson *et al.*, 2010).

One of the methods that can be used to get farmers to adopt new innovations starts with creating awareness, whereby the farmers talk to other farmers – with similar backgrounds – who have adopted the new innovation and are now reaping the benefits. Once the farmers are convinced about the innovation, they will be more open to learn the required skills needed for the innovation, which includes the need to get organized into farmer groups. The extension worker should make the farmers aware of potential risks with the new innovation and the farmers should start new enterprises on a small-scale trial to minimize risk. The extension worker should also visit the farmer groups regularly during the first season to answer any questions or concerns as well as finding timely solutions to any potential problems before the problem becomes serious. After

the first successful season, the farmers should gain confidence and thereafter be more open to expansion or diversification (Swanson *et al.*, 2010).

2.12 TOWARDS A NEW PARADIGM FOR AGRICULTURAL EXTENSION

From the aforementioned literature review a set of criteria are now proposed to inform and guide a new paradigm for agricultural extension support for small scale farmers. This set of criteria is important to incorporate into an extension model for the Eastern Cape Province.

2.12.1 Extension, research and technology transfer

A fundamental requirement of any effective technology transfer system is the dissemination of the results of research in a user-friendly manner, and the transmission of farmers' needs and problems back to the research organization (Low, 1995; Mettrick, 1993; Ruttan, 1982). One of the most difficult roles of extension workers is diagnosing farmers' real needs. This involves a close study of local household systems, agricultural production constraints and possible solutions.

In order to perform this function properly, effective lines of communication must exist between the research organization and subject-matter specialists, extension services (public and private sector), and the farmers (Evenson, 1989).

A continuum of activities is required including research, technological adaption, testing and the use of validated information by farmers. This approach furthermore requires joint problem solving between researchers, subject-matter specialists and farmers aimed at bridging the present technology gap.

What such a system achieves will depend on the commitment and support of government and effective management of all required functions in the system, especially effective communication linkages. For agricultural extension and research to be successful in meeting farmers' needs, a stream of risk-reducing, profitable,

affordable production packages, together with knowledge and skills training, must be extended to both male and female farmers; without adequate linkages between applied and adaptive research, extension workers and farmers, such effectiveness is not possible.

Improved technology is of little benefit if it cannot be made available to farmers, and, conversely, it is difficult to develop useful research programmes unless there is sound feedback on farmers' problems to research. Trials on proven technology carried out by selected co-operator farmers guarantee that technology being channelled into rural communities is adaptive, relevant and acceptable to farmers (Van Rooyen *et al.*, 1998).

2.12.2 Agricultural information and user charge

Farmers need information to improve and develop their farm. Extension services are needed to the extent that they can facilitate access to relevant and timely information. Farmers will furthermore be prepared to pay for information if they perceive the marginal benefits to be greater than the cost fee (Zijp, 1992).

Information can be perceived to add negative or zero net benefits if it is inaccurate or inappropriate. If this is the case, extension services will be viewed as irrelevant or inefficient. It can, however, be argued that resource-poor or small-scale farmers do not have the necessary knowledge base and know-how to judge the real value of new information and extension accurately as it pertains to new farming systems and technology. Willingness to pay is therefore not a necessary condition for the design and structuring of extension services in agriculture. Rather, it is proposed that the following questions be asked to assist in the design of an appropriate service system (Zijp, 1992):

- Who will be the future clientele of extension?
- What kind of information is needed?
- Who are the suppliers of information – public, private or mix – and who sets the conditions and parameters for information (and research)?
- Who will or can pay, particularly the recurrent costs?

- How will information be transferred – government or private sector, or both, and who will pay?

2.12.3 The financing of effective public extension systems

Agricultural extension services are an important tool in promoting agricultural development (Birkhaeuser *et al.,* 1991; Anderson *et al.,* 2007). There are more than half a billion official extension workers worldwide (World Bank, 2006). About 90% of the world's extension personnel are located in developing countries, even though the farmer : extension worker ratio is more favourable in industrialized countries (Anderson, 2008). There is a challenge for the financing of these services in a cost-effective and sustainable way that fits country-specific frame conditions (Leeuwis, 2004). Most governments have inadequate financial resources to adequately cover extension operational and programme cost, especially at the field level. The reason is that budgets get cut and ministries of finance cannot cut salaries and benefits or basis building services (e.g. electricity), therefore the area that routinely gets cut is the operational part of the budget (Swanson, 2008).

According to Christoplos (2010) it is important that extension financing and extension delivery must be seen as separate, regardless of whether extension services are financed by farmers, the government or commercial actors. Extension activities can be financed by the government and entirely delivered by private extension agents. NGO's can also contract public extension services to provide services for private contracts received by them.

According to Anderson (2008) public extension must be funded to serve poorer farmers and those farming smaller and less favoured areas. It is also supported by Rivera *et al.* (2004) that small-scale and poorer farmers may be served by public extension. At the same time, commercial farmers who can pay for services can use private extension (Wilson, 1991; Dinar *et al.*, 2001). The commercial farmers can then determine the type of information that is of priority to them and what they will pay for the extension advice.

2.12.4 Access to markets and marketing services

Access to resource markets, including land and, input, finances, commodity and support services, are major empowering mechanisms for small farmer development. Structuring access to these markets and their monitoring should be an important public sector responsibility. Measures to release constraints and to provide information on market opportunities will be of equal importance.

The creation of niche markets provides opportunities for the provision of a whole range of products – from rudimentary to highly sophisticated. Market analyses should establish whether deregulation or regulation is necessary to allow for the full exploitation of possible niches. Health standards should be adapted to allow for niche markets to develop and food commodities to be transferred to needy consumers. Training and counselling directed at emerging entrepreneurs should be identified as important support services.

The provision of physical market service facilities and infrastructure to support trade in informal markets may require public sector intervention during initial stages, although this should not be the general rule. Rather, private sector investment should be facilitated by the public sector. In areas within inadequate basic infrastructure such as water, electricity and protective services, public sector intervention will be required. User change principles should be considered as in the case of other public investment (Van Rooyen *et al.*, 1998).

The primary focus of agricultural extension today is no longer on increasing production but rather on enhancing rural incomes through market-orientation and responding to farmer demand. Market-orientation relates to value chain development as a whole. Value chain development may require effective communication and facilitation of linkages, coaching of interactive learning and collaboration among a broad spectrum of actors within the value chain (Christoplos, 2010). Extension's role in supporting market-orientation in these platforms may thus be to encourage a dialogue wherein these stakeholders can come together to negotiate and build social capital.

2.13 IMPLICATIONS FOR A NEW AGRICULTURAL EXTENSION MODEL

From this chapter, one can gain an understanding of why extension originated and the importance thereof. Various extension approaches, systems and models were also examined and important lessons were learnt on the relevancy of these and their applicability to the Eastern Cape Province's smallholder and communal farmers. Research also needs to be conducted on the effects of an extension system so that the system can be modified to make it more effective. Important lessons that were learnt include:

- Technology transfer is important, but it must be complemented with human capital development of farm households, social capital development through farmer organizations and sustainable resource management;
- A participatory approach that incorporates bottom-up planning is imperative, but any intervention should not try to control social processes, but rather negotiation, social learning and network building should be the core processes in a participatory approach;
- An advisory approach is more suited towards commercially-orientated agriculture and would therefore not yet apply to a model geared towards serving smallholder and communal farmers. Once these farmers have become more commercially orientated, this approach could be used;
- The guidelines set out in the Project Approach are important, but the top-down approach inherent in this approach should not be included;
- Moving away from using the Developing Countries' Extension System is a positive move as it does not make use of institutional and other support services and providing resources to these services. It also employs a top-down approach, has no linkages with other institutions and no participation of farmers in decision making;
- The T&V System had its merits in some respects, but its practicality is limited today as can be seen by the withdrawal of this system and the associated

funding. However, there are lessons that can be learnt from this system that can be incorporated into the model that will be developed. Firstly, dissemination of appropriate technologies and innovations needs to be accelerated in order to improve the livelihoods of farmers. Secondly, production systems need to be identified and developed for the different prevailing conditions (socio-economic and physical). Thirdly, extension officers must be educated in the principles of extension, should be trained regularly and have close linkages with research. Fourthly, extension activities should have a time frame. Following this, the negative aspects need to be examined so that the same mistakes do not re-occur. Therefore, appropriate technologies need to be developed and disseminated, the model and its application should not cause budget constraints, there needs to be funds to implement programmes, extension officers need to be adequately trained and the extension officers need to be in the field. These factors need to be considered in the designing of any new model;

- The FSR/E model seems to be an improvement on many of the negative aspects of previous extension approaches mentioned above. The emphasis placed on consultation with farmers and the strong linkages with research is commended. This should therefore be included in the extension model that will be developed;
- The USCES model would be difficult to implement in other countries, but there are lessons to be learnt from this system. The lessons that one can learn from this system is that strong commitment to agricultural development is a prerequisite, an effective extension system will take a long time to develop, there needs to be strong linkages with educational institutions, the extension system must be viewed as an integral part of a nation's development such that funding the system will not be seen as a burden and there needs to be political stability; and
- The AKIS/RD model does not employ a linear approach, which can be commended. This system has also advanced the ideas of the FSR/E model by including education in its model. Another important aspect that can be commended is that this model has incorporated farmers as central to the model.

Also from this chapter, a number of implications for the proposed model for the Eastern Cape have surfaced. Agriculture operates in the global village now and the extension service must adapt to this so that they can inform farmers about the necessary adjustments that need to be made. Globally, extension services have undergone market-driven reforms and have an agribusiness orientation. Small-scale farmers should be grouped into producer groups so that extension workers can reach a greater number of farmers. This can also lead to the expansion of different types of services available to farmers. The extension service has also moved towards including demand-driven innovations, sustainable practices and diversifying farming systems in conjunction with technology transfer.

Agricultural Innovation Systems have an important role in helping improve the extension service, but multiple actors do need to be included in this system. There may be a need to include innovation brokers – who are independent – as communication may break down between the different parties involved and these brokers are in charge of resolving issues. The changes in the way extension is practiced needs to be included in the proposed model such that imposing pre-defined innovations is not appropriate and the extension service should rather manage the innovation process. Changing the terminology from 'extension' to 'communication for innovation' and from 'extension worker' to 'change agents' or 'communication specialists/workers' needs to be discussed with the extension workers and farmers before any conclusions can be reached here.

The changes in the extension organization have several implications for the proposed model. Decentralization is an important factor to consider as it conforms to supporting the notion that the farmers needs' are considered before the needs of politicians and the needs of the national departments of agriculture. Market-orientated extension should also be included as this means that farmers' needs are met rather than their needs as perceived by researchers. Pluralism is an option that can be considered once the present dualism in the agricultural environment is no more, so pluralism will not be considered for the proposed model at present. Bottom-up or participatory approach in

extension is an important development that will be included in the proposed model as this approach has been found to encourage ownership of development initiatives.

Other developments in global extension include weakened linkages with traditional research institutions, while some extension services are using a multitude of sources for research, which includes farmers. Interactive learning is another important activity that needs to be considered. The use of a multitude of sources for research and interactive learning are necessary for the new proposed model. When designing the proposed model, it will be necessary to strengthen the factors that support effective extension – such as communication, organizational development and human capital development.

CHAPTER 3

AGRICULTURAL EXTENSION IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA

3.1 INTRODUCTION

This chapter involves a description of the present agricultural situation in the Eastern Cape and it includes the mission, vision and evolution of the public extension service. There is also the determination and proposal of criteria that are important – according to the Eastern Cape's context in developing an agricultural extension model/paradigm.

3.2 STUDY AREA: SOUTH AFRICA

The Republic of South Africa is at the southern-most tip of the continent of Africa, located latitudinally between 22° to 35° S and longitudinally between 17° to 33° E. It has a surface area of 1.2 million km^2 and is surrounded by the Atlantic Ocean to the west and the Indian Ocean to the south and east. South Africa borders Namibia, Botswana, Zimbabwe, Mozambique and the small Kingdom of Swaziland. The Kingdom of Lesotho is a land locked country entirely located within the borders of South Africa (GCIS, 2003).

Before 1989, the government upheld white minority rule, whereby Africans, Indians and Coloureds were discriminated against under the *apartheid* system. Under this system, only 14% of land was set aside for Africans in ten "homelands" allocated for 44% of the population (Nel *et al.*, 2000). The largest of these areas were Transkei, Bophuthatswana, Venda and Ciskei. These homelands were not recognised as independent countries by other nations and relied on the Government of South Africa for all matters regarding state and internal affairs (Stroebel, 2001). Following the first democratic elections in 1994, the former homelands were reintegrated into South Africa and nine new provinces were delineated: Northern Cape, Western Cape, Limpopo, KwaZulu-Natal, Eastern Cape, Mpumalanga, Gauteng, Free State and North West.

However, as a legacy of the country's history, the economy is still largely controlled by whites, with a largely non-white labour force.

According to Census figures, 79% of the population is African, nine percent Coloured, 2,5% Indian or Asian and ten percent White. The total population of South Africa is estimated at 45 million people (StatsSA, 2003).

The topography and surrounding oceans influence the climate of South Africa, and temperatures as high as 32°C are common between December and February. The average annual rainfall is 464 mm, compared to a world average of 857 mm. As can be seen in Table 3.1, this amount is regarded as the absolute minimum for successful dryland farming in South Africa. Periodically, the country is affected by wide-spread and prolonged droughts, which often end in severe floods (M'Marete, 2003).

Table 3.1 Bioclimatology of South Africa

CLIMATIC ZONE	AREA (%)	ANNUAL RAINFALL (MM)
Arid	50	<500
Semi-arid	40	500-750
Sub-humid	10	>750

3.3 STUDY AREA: THE EASTERN CAPE PROVINCE OF SOUTH AFRICA

This province lies on the south-eastern coast of South Africa and is a region of great natural beauty. It has diverse climates and landscapes that range from the dry and desolate Great Karoo to the lush forests of the Wild Coast and the Keiskamma Valley; the fertile Langkloof, renowned for its rich apple harvests; and the mountainous southern Drakensberg region around the town of Elliot. One of the Eastern Cape's main features is its spectacular coastline, lapped by the temperate Indian Ocean, with long stretches of un-spoilt sandy beaches, rocky coves, secluded lagoons and, towering and rugged cliffs. Its rugged cliffs, rough seas and dense green bush gave the north-eastern part of the region the infamous moniker that is known as the Wild Coast. However, the

province appeals to all tastes due to the aforementioned diversity. Figure 3.1 depicts the location of the Eastern Cape Province within South Africa.

Figure 3.1: Location of the Eastern Cape in South Africa

Lying in Algoa Bay is Port Elizabeth, the largest city in this province and an important harbour. Algoa Bay is also host to the deep-water port of Ngqura at Coega. Other major towns include the provincial capital of Bhisho; Uitenhage, which has important motor vehicle manufacturing and related industries; King William's Town, rich in early settler and military history; Grahamstown, the judicial capital that is also known as the City of Saints because of its more than 40 churches; as well as Mthatha; Graaff-Reinet; Cradock; Stutterheim; Aliwal North; and Port St John's, the largest town on the Wild Coast. Due to the province's size, it is divided into several different regions or districts and these are depicted in Figure 3.2.

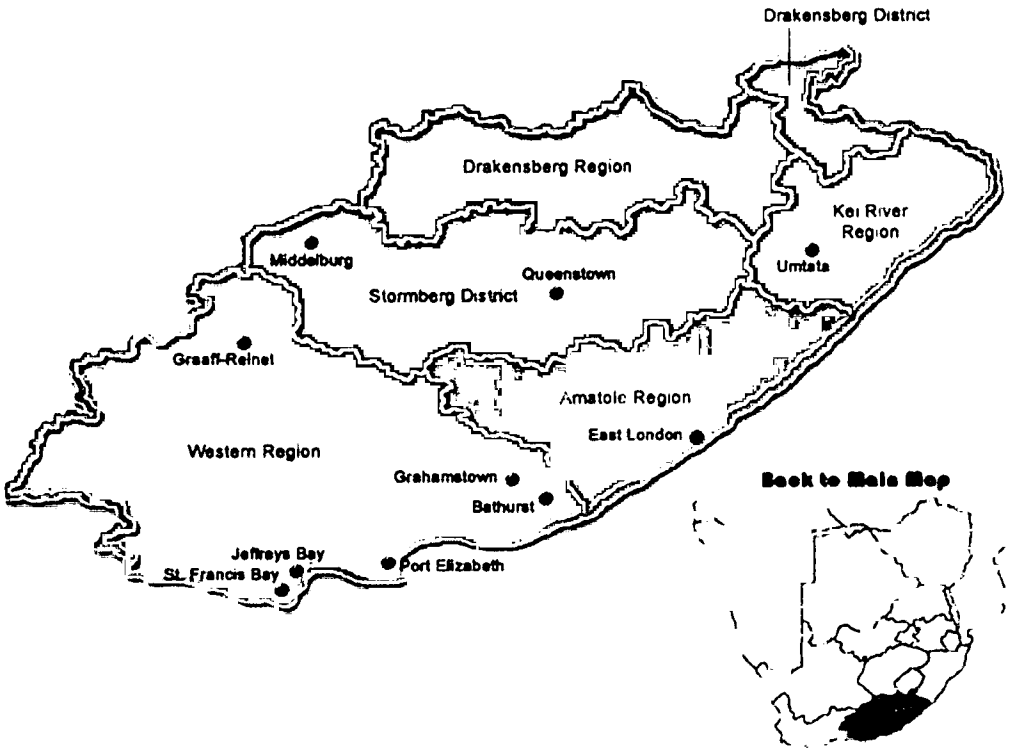


Figure 3.2: The different districts within the Eastern Cape Province

3.3.1 Socio-economic overview

According to Stats SA (2008), the Eastern Cape has a population of 6 579 300, out of South Africa's total population of 48 687 300. Of the 6.5 million population of the province, 52% is men and 48% is women. And about 60 percent of the population lives in rural areas. The Eastern Cape Province wants to reduce poverty by half in 2014 and this share the Millennium Development Goals (MDG) with South Africa. To achieve this goal agriculture must grow by 6 percent to reduce poverty (Annual Performance Plan, 2011-2012).

The Eastern Cape Province is characterized by high levels of poverty, unemployment, underdevelopment, agriculture infrastructure backlog, and poor public health profile, decline in life expectancy rate, low literacy rate, and high demand for housing, water, sanitation, social security and electricity.

The largest population of the province resides in O.R. Tambo District (Stats SA, 2008).

3.3.2 Economic and Fiscal Environment

The province has metropolitan economies in Port Elizabeth and East London, and these are based primarily on manufacturing, with the most important production being automotive manufacturing. The province is truly the hub of South Africa's motor industry. Several of the world's biggest vehicle manufacturers have plants in the Eastern Cape and these include Volkswagen, Ford, General Motors and Daimler Chrysler.

With two harbours and three airports offering direct flights to the main centres, and a road and railway infrastructure, the province has been earmarked as a key area for growth and economic development. Environmentally-friendly projects include the Fish River Spatial Development Initiative (SDI) and the Wild Coast SDI. There are also two industrial development zones, the West Bank in East London and near Port Elizabeth, Coega - the largest infrastructure development in post-apartheid South Africa. Plans for the development of the Coega area as an export-orientated zone include the construction of the deepwater Port of Ngqura. Other important sectors in this province include finance, real estate, business services, wholesale and retail trade, as well as hotels and restaurants.

The Eastern Cape has a dual agricultural economy, a well-developed commercial sector and predominantly subsistence sector. Agricultural contribution to the economy of the Eastern Cape shows a gradual decline. Commercial sector contribution to the Gross Domestic Product (GDP) was 2.5 percent in 1998 and 2.2 percent in 2009. Agricultural sector includes fisheries and forestry (Annual Performance Plan, 2011-2012).

3.4 AGRICULTURAL DEVELOPMENT IN THE FORMER TRANSKEI AND CISKEI

People living in pre-colonial Transkei and Ciskei were classified as having the 'Eastern' ecological adaptation and this was characterised by homesteads occupying small areas of land with the full range of natural resources needed for self-sufficiency. As the

population grew, new homesteads were built around the natural resources. Once the European colonies established themselves, they seized land from the local inhabitants and forcibly sent them to areas already under population pressures. This led to intensification of land use without any conservation measures in place (McAllister, 1992).

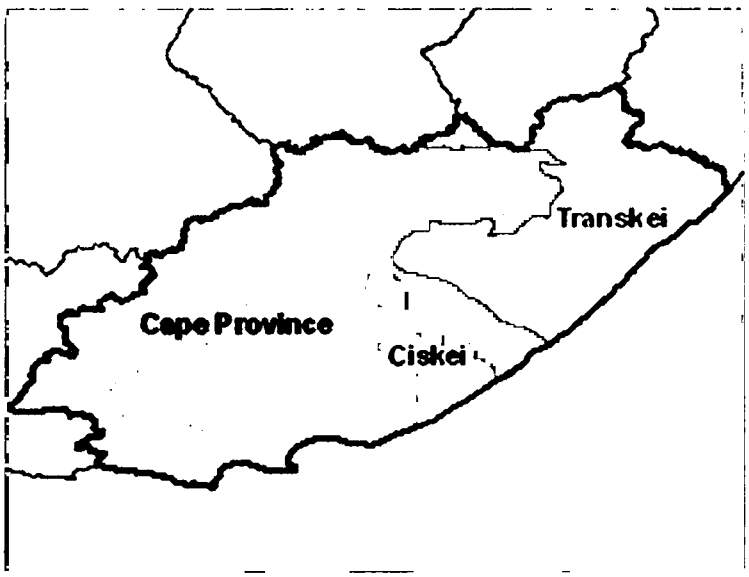


Figure 3.3: Position of Ciskei and Transkei within the Eastern Cape Province

Along with the arrival of white colonies, came the Apartheid regime and the creation of homelands such as the Transkei and Ciskei. The location of the Transkei and Ciskei can be seen in Figure 3.3. Subsequently, this lead to forced settlements in this region with more environmental degradation resulting. A top-down approach, known as the Betterment Strategy, was implemented to correct the degradation taking place. This entailed the concentration of households into villages with prescribed areas for livestock grazing and cultivation. The Betterment Strategy resulted in a higher concentration of activities around villages, which resulted in added degradation around these new settlements. The Betterment Strategy was not wholly accepted by all the communities in the Transkei and Ciskei as many people resisted change due to the loss of land and livelihoods (Hoffman *et al.*, 2001).

The Transkei and Ciskei has, since the advent of the homelands, undergone a variety of rural development programs. These programs have had a strong Eurocentric focus with

top-down approaches that have been largely unsuccessful and fundamentally flawed; nonetheless, they are continually pushed through with development policies. Many of these projects focus on the use of 'improved' seeds, inputs and practices – in the same style as the Green Revolution – with little participation in the planning process by the projects' participants. The end result of these types of projects was a lack of ownership and even further degradation (Hajdu, 2006).

Under the Zuma presidency, rural development has become a key focus area and the Ministry of Rural Development and Land Reform is in charge of this focus area. The aim is to reduce rural poverty with the provision of water, food-security, sanitation as well as shelter. A rural development strategy has been formulated to fulfil the above human needs and this is known as the Comprehensive Rural Development Program (CRDP). This program is still in its pilot stage with three trial villages testing the development program before widespread implementation is carried out (Zuma, 2009).

Past rural development programs have failed for various reasons and the CRDP is aimed at reversing this trend. The vision of the CRDP is to create rural areas that are sustainable, vibrant and equitable. The program aims at holistic development through the incorporation of all aspects of the rural environment as well as through the creation of employment opportunities in all spheres of this environment. The aforementioned strategies entail various phases that aim to create entrepreneurial enterprises and industries at village level. Indigenous technical knowledge is used as the foundation, which is then incorporated with appropriate modern technologies to improve productivity levels.

3.5 AGRICUTLURAL EXTENSION IN THE EASTERN CAPE PROVINCE

At present, the Eastern Cape's Department of Agriculture uses the FSR/E extension model in conjunction with a linear management arrangement. This linear management arrangement is such that there is a manager at district level, an assistant manager at the local municipality level, controllers and scientists at the service centres, and extension technicians at the ward level. Figure 3.4 displays the FSR/E extension model.

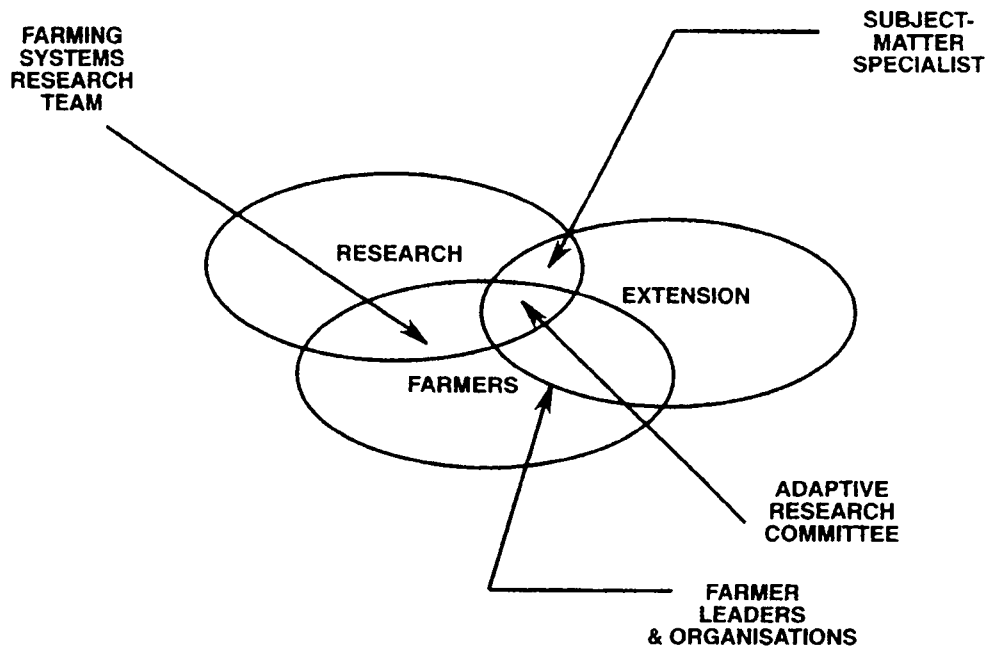


Figure 3.4: FSR/E Extension Model

While this model has been used successfully in the past, it does not incorporate any of the other actors within the agricultural extension environment, such as in the ATMA model (Anderson, 2008). The linear management arrangement is also outdated as modern extension organizations follow more decentralized approaches.

The problem related to extension delivery has been continual within the Eastern Cape's Department of Agriculture over a period of years. Despite various debates in different Departmental Extension Summits, conferences and forums of the department, little or no major delivery breakthrough has occurred. Nevertheless, the problem is not limited to the Eastern Cape as most of South Africa's Provincial Departments of Agriculture face extension delivery challenges. Challenges are experienced more frequently in provinces that have great rural regions and rely more on extension service delivery in their rural development. Department of Agriculture, Forestries and Fisheries (DAFF) has identified provinces like Limpopo, Mpumalanga, Eastern Cape and KwaZulu-Natal as the provinces needing more attention as far as extension recovery is concerned. The introduction of the Extension Recovery Plan brought with it, new hope for extension and

it serves to energise extension officers. For a long time, extension officers felt dejected and were always uncertain about their future and the future of extension (Mudau *et al.*, 2009).

The Extension Recovery Plan was an initiative of the formerNational Department of Agriculture (NDA). The NDA's intervention was a given year plan which was aimed at ensuring enhanced and a new focus in extension. The process was preceded by the employment of a service provider whose mandate was to establish the current status of extension personnel in all provinces. The outcomes of the service provider included:

- Compiling a list of all categories of the current government agricultural extension and advisory personnel nationally;
- Compiling a demographic profile of the said agricultural extension and advisory service personnel;
- Including the major subjects associated with the qualification/s obtained;
- The current official title and function of the officer; and
- The scope of work covered by each extension agent.

The understanding on issues of training was that training requirements for extension workers was being identified by their respective provinces. The number of trainings given per province was proportional to the total number of extension workers in the province and to the total number of extension workers to be nationally trained within a financial year. The NDA was to enter into Service level agreements with some Public service Providers for the training of extension workers, preferably providers having a deeper understanding of the extension environment (Mudau *et al.*, 2009).

The extension recovery plan breathed new life into extension. Never before has there been a situation in which extension personnel are prioritized and have adequate access to bursaries and other working resources. The exposure of extension personnel to different courses and training is adding more commitment towards the work and their self-esteem is enhanced. With proper implementation of the green book reporting

system, both reporting and monitoring and evaluation of extension services could be enhanced (Mudau *et al.*, 2009).

Annexure 1 gives an overview to the Strategic Plan of the Department of Agriculture in the Eastern Cape (2009). According to this Strategic Plan agriculture is the backbone of the economy in the Eastern Cape Province. The Strategic Plan have six objectives. They are:

- Systematic poverty eradication through a holistic, integrated and multi-dimensional approach to pro-poor programming.
- Agrarian transformation and strengthening of food security.
- Consolidation, development and diversification of the manufacturing base and tourism potential.
- Human Resource Development.
- Infrastructure Development.
- Public Sector and Institutional Transformation.

The extension services in this province will play a very important role in achieving these objectives. Out of the Strategic Plan for Agriculture a set of criteria is important to incorporate in the new Extension Model for the Province. They are:

- Sustainable Agricultural growth must lead to small-scale farmers becoming more commercial. This will be done through the Green Revolution Strategy of the Department.
- The eradication of extreme poverty and hunger which is part of the millennium development goals.
- Farmers in rural areas must get access to extension services to help them to increase agricultural production from 10% - 15%.

- There will be redistribution of land and extension workers must ensure that these new farmers have access to specialist support services.

3.6 CONCLUSION

It can be seen from the strategic plan of the Department of Agriculture in the Eastern Cape that support services play an important role in this province. It is therefore important to have a good extension model for the Eastern Cape.

The most difficult yet important challenge facing public agricultural extension system is the need to decentralize programme planning and specific management functions to the district and subdistrict levels. After decades of operating within a top-down, technology-driven extension system, it is difficult to convince national and provincial/state-level extension directors and senior managers to delegate decision-making authority to more junior-level staff members at the district and subdistrict or field level. Also, shifting this programme-planning and decision-making authority is an intricate process, which requires the full understanding of all parties involved, systematic capacity building at the lower system levels, and careful coordination to ensure successful implementation.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

In this chapter the research methods will be discussed. Theresearch design, aims of the research study as well as the characteristics of the participants, data gathering processes, the measuring instrument and statistical analyses will be explained.

4.2 RESEARCH PARADIGM

Four theoretical paradigms exist in terms of the research methodology:

(i) positivism;

(ii) realism (post positivism);

(iii) critical theory; and

(iv) constructivism.

The diversity and complexity of the people involved in extension in the research area necessitates the adoption of a multi-disciplinary approach in the current study (Doyer et al, 2001).

The application of principles form the field of neoclassical economics requires supplementing with the holistic application of various economic theories taken from the constructivist paradigm. The complexity of the constructivist approach is relevant to the dilemmas and tensions with which the field of empowerment is fraught. The adoption of this approach affords the researcher the opportunity to create knowledge through interaction with the subject(s), in terms of which previously held constructions are reconstructed (D'Haese et al, 1998).

The post-positivism approach is taken to analyse the perceptions in the knowledge, innovation and technology systems through a statistical survey analyses with extension officers, researchers and scientists. The adoption of a constructivist approach assists with developing a new empowerment construct, which is refined by means of a log frame analysis. The post-positivism approach taken (which takes into account the ratings and gaps, to which statistical analysis is best suited) is supplemented with the adoption of a constructivist approach (which takes into account the triangulation, corroboration and governance gaps, to which interviews, discussion session and action research are best suited). Although the two paradigms are integrated in this study, it must be noted that a quantitative approach is embedded in a qualitative approach (D'Haese et al, 1998).

4.3 RESEARCH DESIGN

The research consisted of two phases. The first phase consists of the capturing of quantitative research - via a questionnaire – from the Eastern Cape's extension workers as well as researchers involved in various segments of South Africa's agricultural sector, such as government, commercial farmers, agribusinesses and agricultural teachers. This was used to determine their perceptions regarding various factors that influence the effectiveness of agricultural extension.

The second phase consisted of the capturing of qualititative data.An adapted Logical Framework Analysis (LFA) or Objective-Orientated Intervention Planning tool is used to determine (i) the needs and problems faced by a focus group of communal farmers in the Eastern Cape, (ii) the extension officers perceptions of what they believe is needed to strengthen the extension service and (iii) what actors from the agricultural support services thought were necessary of the extension service for it to be improved.

The quantitative research was done to identify important factors that influence agricultural extension. The qualitative research evaluated the current extension system in the Eastern Cape by looking at the important factors from the quantitative research.

4.4 AIMS

The researcher aimed to determine the needs and problems faced by small-scale communal farmers and whether the extension workers had the correct perceptions related to successful agricultural extension and subsequently determine whether the extension workers were able to meet the needs of the farmers and to help the farmers to help themselves.

The present agricultural extension model, which was analysed in the chapter 3, will be examined in light of what improvements can be made to it in order to improve the effectiveness of agricultural extension.

4.5 THE QUANTITATIVE RESEARCH

The quantitative research enquiring in this study focused on the determination and analysis of perceptions of researchers and extension workers in the Eastern Cape. The data was collected through a questionnaire (Annexure 3). From different sectors in agriculture, the sample consisted of 180 participants of whom 80 participants were researchers conducting studies involving sustainable agriculture, rural development and extension, and 100 participants were extension workers.

4.5.1 Sample

The youngest participant in the study was 21 years old and the oldest, 59 years. The mean age for the sample was 37.29 years. Almost three-quarters of the sample was male (73%), with 27% of the sample being female participants.

Just over half of the sample had already obtained a degree/advanced diploma (57%) while approximately 38% had completed a National Senior Certificate. A small proportion of the sample had already obtained a masters degree (4%). Only one participant had a qualification lower than NQF level 5. Approximately two-thirds of the sample is currently studying towards a higher NQF level.

The overwhelming majority of the sample is currently employed (94%). Of the 11 participants who are not employed, five were studying and six were extension workers (currently not employed). Of those who indicated that they are currently employed, the number of years of employment at their current position ranged from 1 to 35, with a mean employment term of just more than 10 years. The majority of the sample has experience in working as an extension worker (83%). Of those who indicated they had experience working as an extension worker, the length of their experience ranged from less than one year (6%) to more than five years (62%), with approximately equal numbers of participants indicating that they had 1 to 2 and 3 to 4 years experience (14% and 13% respectively).

4.5.2 Data collection

Permission for the study was granted by the Eastern Cape Department of Agriculture. Data collection occurred both at the University of the Free State as well as in the Eastern Cape. Both the researchers as well as extension agents from the Eastern Cape Department of Agriculture participated in this study. The data was collected by the author between July 2009 and December 2009.

4.5.3 Data capturing and editing

The completed questionnaires were coded appropriately and captured electronically. Data was scanned for outliers and potential errors. No systemic errors or outliers were found.

4.5.4 Data analysis methodology

The questionnaire consisted of 3 sections. Section A consisted of questions related to biographical information (age, gender, employment status, level of formal qualification). Section B consisted of 32 questions related to the factors that *enhance* the

effectiveness of extension workers. Participants were requested to respond to the items on a 5 point Likert-type scale where 1 indicated that they strongly disagreed and 5 indicated that they strongly agreed with each statement presented to them. Section C consisted of 12 questions related to factors that *hinder* the effectiveness of extension workers. The questions in Section C required participants to respond on a 5-point Likert-type scale where 1 indicated the factor was not a constraint to the success of extension workers and 5 indicated that the factor was a big constraint to their success.

Individual items from Sections B and C were grouped together according to eight broad factors that impact on the effectiveness of extension workers. Each of these item sets were treated as subscales for the purposes of analysis. The eight subscales and the number of questions related to each subscale is reflected in Table 4.1 below. The subscales were used to construct a matrix.

Table 4.1: The eight subscales

Subscale	Number of Items	Item Numbers
1. Personal characteristics of extension workers	10	18.1-18.5, 20.1, 20.2, 20.3, 21, 22
2. Training of extension workers	9	3, 4, 6, 7, 8, 10, 18.6 and constraint 1 and 8
3. Leadership and mentoring ability	9	11, 12, 13, 14, 15, 18.7, 18.8, 19.2 and constraint 9
4. Support (technical and skills)	3	1 and constraints 2 and 3
5. Financial factors	3	17 and constraint 4 and 5
6. Community cooperation and networks	2	16 and 19.1
7. Communication	2	2 and 12
8. Staffing related	2	Constraint 7 and 11

Responses to each of the items on the 5-point scale were converted to a numerical value out of 100. The mean score for the scale was then determined at an individual level. These mean scores for each scale (as a value out of 100) will be used for the purposes of data analysis.

The data was analysed using both descriptive as well as inferential statistics. Descriptive statistics were used to describe and compare the responses for each item and the groups of items for the overall sample, as well as by the following variables: status (researcher or extension worker) and gender (male or female).

The descriptive statistics that were explored are the mean and standard deviation. Where the mean is the average score for the group on each of the subscales calculated with the following formula (Salkind, 2008):

$$\bar{X} = \frac{\Sigma X}{n}$$

Where: Σ represents the sum of all the X individual scores on the subscale

n represents the number of respondents

The standard deviation represents the amount of variability between scores, in other words the average deviation of the individual scores from the mean. The formula used to determine the standard deviation is as follows (Salkind, 2008):

$$s^2 = \sqrt{\frac{(X-\bar{X})^2}{n-1}}$$

Where: X represents the individual scores on the subscales

$\bar{X}$ represents the mean for the subscale

n represents the number of respondents

sum of all the X individual scores on the subscale

The scores on the subscales determined by the descriptive statistics were also used to rank the mean scores on the subscales in order to investigate differences between the two variables of interest in terms of the relative importance they attribute to each variable.

Inferential statistics were used to test the differences in responses to the eight subscales for the following variables: status (researcher or extension worker) and

gender (male or female) by means of a t-test for independent groups. According to Pallant (2007) this is the most appropriate test to use when the mean scores for two independent groups is being compared. The following formula was used to calculate the t-statistic (Salkind, 2008):

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\left[\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2)}{n_1 + n_2 - 2}\right]\left[\frac{n_1 + n_2}{n_1 n_2}\right]}}$$

Where: $\overline{X}_1$ is the mean of the scores for the subscale for group 1

$\overline{X}_2$ is the mean of the scores for the subscale for group 2

s_1^2 is the standard deviation of the scores for the subscale for group 1

s_2^2 is the standard deviation of the scores for the subscale for group 2

n_1 is the number of people in group 1

n_2 is the number of people in group 2

For all the t-tests, two-tailed tests were conducted and the 5% level of significance was used in order to make the decision about the null hypothesis.

4.6 THE QUALITATIVE RESEARCH

ALogical Framework Analysis (LFA) was used in this part of the research as a method of strategic planning for the qualitative phase of the study. This method will be briefly discussed in this section:

LFA follows a logical pathway of cause-and-effect. This method of research does not give statistically-significant evidence, but rather gives very authentic qualitative research. LFA starts by determining the core of the problem. Thereafter, the research population were asked to identify the negative causes of identified problems. Then the

research population is asked about the negative effects that result from the identified causes (van Rooyen*et al.*, 2002).

As an end result, one can construct a Logical Framework Matrix with the core problem in the middle. From the core problem, the negative effects branch upwards and the negative causes branch downwards, such that this diagram resembles a tree with a stem, branches and roots. This is termed the Problem Tree. Once this is constructed, one constructs a new LFA that identifies the farmers' objectives and the activities required to reach their goals. This LFA is a positive reaction to that of the first LFA. The second diagram contains the core objectives, activities and the farmers' envisaged ends (van Rooyen*et al.*, 1994).

The core objective is the goal of what the farmers want to achieve, with the ends being the outcomes that they would like to realise and the activities are what is required to achieve the core objective and ends. This is again displayed in a LFA diagram with the core objectives being the stem, the activities being the roots and the ends being the branches with the metaphorical fruit. This tree is known as the Objective Tree.

The LFA has the following advantages; this approach aims to make the strategic planning process transparent by stating assumptions of analysis, it deals with a multitude of goals and does not require the benefits to be reduced into one figure, this approach is flexible in its information and skills requirements, and the LFA can be understood by non-business executives (Doyer *et al.*, 2001).

A SWOT analysis was also conducted with agricultural extension workers. It was used to evaluate the Strengths, Weaknesses, Opportunities and Threats (SWOT) involved in their work as extension workers. This is a method that originated through an analysis of enterprises based on the opinions of employees regarding the strengths and weaknesses of their own work. The SWOT starts by finding out about the situation unknown to them, such as the situation for the extension workers at the farmers on their farms: by asking what activities were carried out and what were the advantages (or successes) and the failures (or the weaknesses) in the activities. It does not stop there and continues by asking who could contribute towards eliminating those weaknesses and how this could be done (Hoffmann *et al.*, 2009).

4.7 RESEARCH POPULATION

There were four separate research populations used in this study; these individual studies were:

1. The questionnaire concerning the perceptions of extension officers and researchers;
2. The LFA, which dealt with the concerns of small-scale farmers;
3. TheLFA, which dealt with how the extension officers thought the public extension service could be improved; and
4. The LFA, which dealt with agricultural support services actors' views on what they believed the task of the public extension service was.

The study population of the quantitative questionnaire consisted of 100 extension officers that were randomly selected as well as 80 researchers who are involved with studies concerning sustainable agriculture, rural development and extension. The small-scale farmers were all from the same village and totalled 12 farmers. This village is one of the villages that make up the Tqolomnqa group of villages within the Amatole District Municipality; this village was randomly selected. Ten extension officers, who were involved in the third study, were randomly selected by the District Manager of the Amatole District Municipality to take part in the research. These extension officers are working in various localities within this district municipality. The research population from the final study were invited business people from agribusinesses within the Amatole District Municipality as well as agricultural economists from the ECDoA. This group were termed actors from the agricultural support services.

CHAPTER 5

TOWARDS DESIGNING A NEW AGRICULTURAL EXTENSION SERVICE FOR THE EASTERN CAPE PROVINCE: A PERCEPTION ANALYSIS[1]

5.1 INTRODUCTION

Within the agricultural environment, the critical stakeholders are the farmers together with agribusinesses, extension workers, researchers, trainers and educators. Generally, problems flow from farmers and agribusinesses to the extension workers and researchers, who thereafter help in solving the problem and relay solutions back to the aforementioned stakeholders.

In South Africa, there are dual economies in the agricultural sector (Stroebel, *et al,* 2011). This is comprised of mainly white-owned commercial farmers and black-smallholder farmers. The country has land-reform policies that are committed to transferring at least 30% of white-owned commercial farms to emerging-black commercial farmers by 2014 (Xingwana, 2008). However, this cannot occur if these transferred farms lose productivity and place the country at risk of food insecurity. The challenge is for the extension and advisory service, and mentors to contribute towards ensuring that these transferred farms remain productive and even increase in productivity.

The agricultural extension and advisory service in South Africa is generally challenged to help farmers to help themselves and to facilitate optimal and sustainable resource utilisation, which would have a direct contribution in solving the problems of rural poverty, food insecurity, and income and employment losses. The Eastern Cape Province of South Africa is comprised of large-scale farmers and smallholder farmers.

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[1] This chapter as an integral part of this PhD study has already been published in the South African Journal of Agricultural Extension:
Van Niekerk, J.A., Stroebel, A., Van Rooyen, C., Whitfield, K.P. & Swanepoel, F.J.C. 2009. Towards designing a new agricultural extension service for the Eastern Cape Province: A perception analysis. *South African Journal of Agricultural Extension*, 38 pp. 65-76.

Extension activities, from the public sector, are aimed mostly at the latter group, but these efforts have been largely ineffective in solving the aforementioned problem (DoA, 2001). In the Eastern Cape, this argument equally applies to high-potential underdeveloped "former homeland" areas.

According to Bese (2007), there is not one single extension model that is suited to every situation in South Africa. Approaches need to be adapted to local situations. It is further suggested by Bese (2007) that a forum be established to help support the extension service. This led the author of this research chapter to believe that there is a need for an extension model specifically designed for the Eastern Cape. The purpose of this model is to help extension workers to mobilize farmers in becoming sustainable and commercially viable. By commercially viable it is meant that farmers can generate an income from agricultural activities that can be used for consumption and investment, and by sustainable it is meant that practices are socially acceptable, economically viable and environmentally friendly (Dumanski, 1997).

In order to formulate a model for agricultural extension, one first needs to determine what factors are critical for effective extension. A number of questions were compiled in a questionnaire and common questions were grouped together to form the critical factors. Quantitative data was received from the questionnaires that were completed by extension workers and selected researchers (80 post-graduate students). The data received from the research population was used to determine what factors they perceive to be of greater and lesser importance. By establishing these factors and their perceived relative importance, the Eastern Cape's Department of Agriculture can use this information to build upon the extension service's and extension workers' capabilities – within these critical factors – for effective extension.

According to Rivera *et al.* (2003), extension services need, among others, both organizational and human capital development (HCD). Organizational development is defined as a planned process of solving an organization's problems and improving its effectiveness. It includes changing organizational structures and processes and is aimed at, among others, enhancing human capital (Cummings *et al.*, 1991). HCD has been defined as the expansion of human capabilities and functions in order to improve

their effectiveness (Budlender, 2003). According to Jordaan (2008), HCD also includes improvements in personal knowledge, attitudes and behaviour, but it is often ignored in favour of improving institutions and infrastructure.

5.2 FINDINGS

5.2.1 Descriptive statistics

Table 5.1 ranks these factors according to what is perceived most important to what is perceived least important by the overall group. It should be noted however, that none of the scores for any of the eight factors are low (when considered out of a maximum of 100). The lowest rated factor, staffing, still had a mean score of higher than 80. It can also be seen that the two factors with the lowest scores also had the largest amount of variation between responses, as indicated in the relatively high standard deviations. From this, it can be concluded that within these two factors, the responses of the participants differed more than the responses of the participants with regard to the other factors. The lower standard deviations for the factors personal characteristics, training and leadership indicate that within these factors, participant responses were more uniform.

Table 5.1: Descriptive statistics for the identified factors: Overall sample

	N	Minimum	Maximum	Mean	Std. Deviation
Personal characteristics of extension officer	177	36.00	100.00	92.64	9.46
Community cooperation and networks	179	40.00	100.00	90.39	12.82
Training of extension officer	180	40.00	100.00	89.54	9.23
Leadership and mentoring ability	177	28.89	100.00	87.80	9.72
Financial support	178	33.33	100.00	86.63	15.31
Support (technical and skills)	180	33.33	100.00	86.59	14.56
Communication	179	30.00	100.00	84.02	16.98
Staffing	178	20.00	100.00	82.13	20.083

Perceptions are not always accurate, as testified by the fact that in the Extension Recovery Plan, the need for more staff is recognised (F.D. Bese, 2010, Senior Manager: Extension & Advisory Service, Pers. Comm.), while the overall group ranked this factor eighth. Communication was ranked as seventh most important, but well-developed communication skills are recognised as an integral part of effective extension (Stevens, 2007) and communication is required at all levels of agricultural activities (Dagada *et al.*, 2007). Although, within the five highest-ranking individual items, the overall group ranked good communication as the most important item and this had a low standard deviation too. This is displayed below in Table 5.2.

Table 5.2: Five highest-ranking individual items for the overall group

Item	Mean	Standard Deviation
Good Communication between the extension worker and the farmer	96.56	9.65
The extension officer must be honest with the farmers at all times	95.11	11.89
The extension officer must be on time, rather early but never late	94.89	11.79
Technical support from the extension workers to the farmers	93.89	12.16
The extension officer must listen carefully to what the farmers say	93.78	14.23

Table 5.3, below, displays the descriptive statistics for the identified factors according to status and gender. As can be seen from Table 5.1 and 5.3, the three top-rated factors – with relatively low standard deviations – across all groups are the personal characteristics of the extension worker, community cooperation and networks, and training of extension officers. There were, however, various differences in how the different groups rated other factors.

Table 5.3: Descriptive statistics for the identified factors: status (researchers and extension workers) and gender (male and female)

	Status				Gender			
	Researchers		Extension workers		Male		Female	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Personal characteristics of extension workers	93.53	7.04	91.92	11.05	92.68	8.83	92.54	11.09
Community cooperation and networks	91.01	10.93	89.90	14.18	91.06	12.56	88.51	13.51
Training of extension workers	90.03	7.69	89.16	10.32	89.46	8.88	89.77	10.23
Leadership and Mentoring ability	87.00	8.21	88.44	10.79	88.04	8.83	87.13	11.87
Financial support	89.79	11.19	84.11	17.58	87.43	14.43	84.40	17.49
Institutional support (technical and skills)	87.50	12.20	85.87	16.23	87.07	13.55	85.28	17.12
Communication	85.44	15.92	82.90	17.77	85.45	16.41	80.00	18.05
Staffing	81.13	19.42	82.96	20.67	81.44	19.81	84.13	20.93

5.2.2 Inferential statistics

Inferential statistics, with the use of a t-test, were used to test the differences in responses to the eight factors for the variables of status (researcher or extension worker) and gender (male or female). It was found that there are significant differences between extension workers (Mean=89.79, Standard deviation=11.9) and researchers (Mean=84.11, Standard deviation=17.58) in terms of financial factors ($t=2.619$, $p<0.05$, two-tailed). In this case, the researchers indicated that finances played a more important role than the extension workers did. There were no significant differences between these two groups on any of the remaining factors. This could be the result of the locality and living expenses of the different groups, with researchers living in urban

environments while extension workers generally live in rural areas. Presented in Table 5.4 below, is the t-test for the identified factors according to status.

Table 5.4: t-test for the identified factors: status (researchers and extension workers)

	Status (researchers and extension workers)			
		t	df	Sig. (2-tailed)
Institutional support (technical and skills)	Equal variances not assumed	0.770	177.369	0.442
Communication	Equal variances assumed	0.995	177	0.321
Training of extension workers	Equal variances assumed	0.629	178	0.530
Leadership and mentoring ability	Equal variances assumed	-0.973	175	0.332
Community cooperation and networks	Equal variances not assumed	0.593	176.908	0.554
Financial support	Equal variances not assumed	2.619	168.266	0.010
Personal characteristics of extension officers	Equal variances assumed	1.126	175	0.262
Staffing	Equal variances assumed	-0.605	176	0.546

Concerning the results from the t-test between genders, it was found that there were no significant differences between males and females in terms of how important they ranked any of the factors to be. The results for the t-test to test the differences between mean scores for gender is presented below in Table 5.5.

Table 5.5: t-test for the identified factors: gender (male and female)

	Gender (male and female)			
		t	df	Sig. (2-tailed)
Institutional support (technical and skills)	Equal variances not assumed	0.655	69.574	0.515
Communication	Equal variances assumed	1.905	177	0.058
Training of extension workers	Equal variances assumed	-0.197	178	0.844
Leadership and mentoring ability	Equal variances assumed	0.556	175	0.579
Community cooperation and Networks	Equal variances assumed	1.172	177	0.243
Financial support	Equal variances assumed	1.167	176	0.245
Personal characteristics of extension workers	Equal variances assumed	0.088	175	0.930
Staffing	Equal variances assumed	-0.782	176	0.435

5.3 DISCUSSION

Eight factorsinherently part of the extension system thatpromote effective extension were identified from the questions. The type of development intervention that is needed is also stated.The identified factors are:

- The personal characteristics of the extension worker;
- Community cooperation and networks;
- Leadership and mentoring ability;
- Communication;
- Training of extension workers;
- Financial support;
- Institutional support (Technical and skills); and
- Staffing.

The **personal characteristics** of the extension worker includes their availability to the farmer, listening skills, preparedness to dirty their hands, timeliness, honesty, ability to get on with people, enthusiasm, common sense and initiative, ability to work unsupervised and have a good work ethic. Jibowo (2008) identified various challenges for effective extension. These challenges have a bearing on the personal characteristics of extension workers and how they perform their duties. Terblanché (2005) agreed with this sentiment by stating that effective extension requires extension workers becoming a part of the community and gaining credibility. This is achieved through personal characteristics that are conducive to effective extension and by being a technical expert in a specific field of study. This factor needs HCD.

Training of extension workers involves the training in principles of effective extension, a formal qualification, HCD, technical expertise in at least one field that is relevant to the area of responsibility/extension ward, a strong knowledge-support system, recruitment of qualified people, linkages with tertiary institutions, adequate flow of research and in-service training. In addition to these, it is of extreme importance for the extension officers to also have a sound knowledge of the client base, environment, potential, resources, priorities, etc. Jibowo *et al.* (2008) defined training as the acquisition of specific skills, knowledge or attitudes that can be used in specific situations. This can be achieved by having inexperienced extension workers working under experienced extension workers and by having the required attitude.

Jordaan (2008) stated that research conducted in East Asian countries revealed that countries that placed strong emphasis and investments on HCD experienced faster economic development, although it is a long-term investment that requires continuous support. Training is not only about HCD, but also about organizational development as a knowledge-support system is required with relevant training material that extension workers can be trained in. This requires partnerships with various institutions such as universities, government, non-governmental organizations, extension workers and communities concerned. Different partners have different skills that can contribute to extension work and in this way there is a flow of knowledge from various institutions to the extension officer, which will ultimately help the farmers (Jibowo*et al.,* 2008). This factor requires HCD for training in principles of effective extension, formal qualifications

and technical expertise in one field of study. Organizational development is required for a strong knowledge-support system, recruitment of qualified people, linkages with tertiary institutions, adequate flow of research and in-service training.

Leadership and mentoring ability entails a clear vision that is future focused, recognition that the farmer's situation is unique, realize people's potential to improve, help farmer conceptualize and prioritize, guide farmers to sustainability, give recognition to farmers' plans, understand behavioural change, encourage self-help and recognise experience-based knowledge systems. According to Lansdale (2008), leadership and mentoring ability can be defined as a nurturing process whereby the knowledgeable extension worker befriends, encourages and teaches farmers. This is performed for the purpose of promoting the development of farmer and farm. Terblanché (2007) found that mentors can be confronted with various obstacles. These obstacles come from both sides and include, from the extension workers' side, frustration occurring from the extension worker's mentoring style which does not meet the farmers' needs and the extension worker may expect too much of the farmers within an unrealistic time period. Obstacles from the farmers' side include farmers having hidden agendas, they might demand more time than necessary and they may have an inappropriate attitude to be mentored. This factor will require HCD.

Institutional support (technical and skills) concerns the need for technical support, logistical support and relevant technologies. Support is given in the form of training of extension workers. This should be supplied firstly by the extension organization as well as by universities, colleges, the Agricultural Research Council, cooperatives and by national and regional government agricultural departments. There are varieties of proposed agricultural development programs in South Africa, but there is insufficient support to facilitate such programs. Support and relevant research is needed and should flow to extension workers so that they in turn can help farmers (Lategan *et al.*, 2006). Van Rooyen *et al.* (1998) argue that commercial, emerging and subsistence farmers have different needs and research is needed for the different types of farmers so that extension officers can be better equipped. This factor requires organizational development so that human capital can be developed.

Financial support entails understanding farming as a business, provision of incentives/remuneration and the availability of working capital. According to Ortmann*et al.*(1995), who performed an economic evaluation on a farmer support program, found that the costs of implementing such programmes – or for that matter, any such programme – is high. Bembridge (1991) agrees that financial support and a strong commitment from the government are important for effective extension. The present extension organization inherited the organization from the previous government whose agricultural system was based on protected markets, but this is being changed to an open market. Research is presently needed that will allow farmers to compete competitively on the open market. Coupled with this problem is the fact that the present extension organization has a limited operational budget, which has further incapacitated the organization (Lategan*et al.*, 2006). This is further evidence that a revised extension model is needed. Understanding farming as a business requires HCD, while the remaining aspects of this factor require organizational development.

Community cooperation and networks involves the identification and recognition of local structures, and earning the respect of the community. According to Terblanché *et al.* (2000), it should be remembered that established groups exist within communities and these groups have leaders that have a significant influence over other members. Groups also have reasons for their establishment and these need to be understood. Bembridge (1991) further adds that one should make a list of formal leaders, local farmer organizations, influential persons, opinion leaders and potential leaders. In a study of opinion leadership in Lesotho, Williams *et al.* (2005) found that opinion leaders were not always the best farmers, but had status within the community. They recommended that extension workers should exploit opinion leaders by providing them with competencies and knowledge so that they can disseminate information. These facts give evidence that identification and recognition of local structures is a factor that facilitates success. It has been found that successful cooperatives have strong links with the extension organization, which has led to better functioning cooperatives and ultimately better farmers (Dagada *et al.*, 2007). This factor requires HCD.

Communication concerns good communication skills and the ability to speak the language of the people in the area. Well-developed communication skills form an integral part of the professional behaviour that extension workers are expected to exhibit and it is one of many competencies that extension workers need to develop in order to be effective (Stevens, 2007). According to Dagada *et al.*,(2007), all aspects of agriculture require communication with people. It is estimated that 75% of 150 000 extension officers in sub-Saharan Africa do not have university degrees and although they have undergone training in technical agriculture, they have not been trained in the human aspects of extension, such as communication (Jordaan*et al.*, 2003). It has been recommended that communication channels between extension workers and farmers be enhanced so that farmers can get better access to skills and knowledge (Tsheole*et al.*, 2008). It should be noted that communication is a two-way process and both farmers and extension workers need to be trained and equipped for effective communication and this forms part of the HCD that is needed.

Staffing involves ensuring an adequate number of staff and restricting personnel from being overloaded by work. The extension organization is comprised of training, research and extension, and the staff of the organization need to do these tasks. In the Eastern Cape Province, and also in South Africa, the extension organization is unable and inefficient in their response to fulfilling the needs of rural communities (Lategan*et al.*, 2006). Farmers interviewed in Qwa Qwa, Free State Province, responded that good extension support is needed for long-term sustainability (Jordaan*et al.*, 2003). This means that for effective extension, there needs to be a sufficient number of extension workers available to support all the farmers in the country. This would however require extensive financial support. Improving this factor will require organizational development.

5.4 CONCLUSIONS AND RECOMMENDATIONS

As can be seen from the data, there is a consensus about what factors are perceived to be more important for effective extension. There certainly are more factors that contribute to effective extension. It is recommended that a future study, with the same eight factors or additional factors, be conducted that includes clients (farmers), NGO's and private service providers. It should be noted that all of the identified factors are important and should be incorporated into the extension organization in a holistic manner. It should be further noted that a division is made between these eight internal factors into those that need HCD and factors that require organizational development. Measuring the effectiveness of extension once these factors have been addressed is required. Indicators for these factors should be developed, but this was not addressed and will require further research.

Factors that require HCD include the personal characteristics of the extension workers, leadership and mentoring ability, community cooperation and networks, communication and training of extension workers partially requires HCD. The training of extension workers, institutional support (technical and skills), financial support and staffing fall in the category of organizational development, although all factors need organizational development as HCD is under the organization's control.

The extension organization needs to take cognisance of these eight factors and should develop the organization within staffing, financial support, institutional support (technical and skills), training of extension workers and other HCD. It also needs to ensure that the organization develops its human capital, especially in areas that respondents paid less attention, such as communication.

As identified earlier, an agricultural extension model is needed for the Eastern Cape. The factors that were identified form the basis from which the proposed model will be based. The proposed model will need to identify various stakeholders that are involved in the broader agricultural environment that will be able to help in the development of the extension organization and in the development of the organization's human capital.

CHAPTER 6

TOWARDS REDESIGNING THE AGRICULTURAL EXTENSION SERVICE IN THE EASTERN CAPE: VIEWS AND PROPOSALS OF SMALL-SCALE FARMERS, EXTENSION WORKERS AND AGRICULTURAL SUPPORT SYSTEMS

6.1 INTRODUCTION

In this chapter, results from interactive focus groups are discussed. Three different focus groups were used; these were smallholder farmers, extension workers and representatives from the agribusiness industry.

6.2 ANALYSING SMALL-SCALE FARMERS' NEEDS[2]

6.2.1 Introduction

There are theories that large-scale commercial farms are more effecient and smallholder farmers should not bother farming. In India, there are over 600 million smallholder farmers that use co-operatives to gain the competitive advantage that large-scale commercial farmers enjoy. Smallholder farmers should therefore be encouraged to increase productivity so that the demand for food – which is set to double by 2050 – can be met (Christoplos, 2010). It is in this light that the research includes smallholder farmers.

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[2] This research as an integral part of this PhD study was accepted for publication in the South African Journal of Agricultural Extension:
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According to Acunzo *et al.* (2010), agricultural extension has changed from the transference of technologies and diffusion of research to a process known as communication for innovation. The latter aims to involve multiple stakeholders and has five steps:

- Encourage people to identify and acknowledge a problem;
- Identifying and collecting together the different stakeholders that are affected by the said problem;
- Working with stakeholders to define ways to affect change, while enhancing the existing communication patterns;
- Addressing the societal cost of creating the change; and
- Critically evaluating and reviewing the change and process.

According to Swanson (2008), over the past 20 years extension has changed from being technology transfer for increased production to improving rural livelihoods in order to reduce poverty and food insecurity. This is to berealized through four broad objectives, namely:

- Technology transfer;
- Human capital development of farm households;
- Social capital development through farmer organizations; and
- Sustainable natural resource management.

The use of farmer groups is an advancement in dissemination techniques as it is more efficient. Farmer groups can reach a multitude of farmers at the same time. Farmers within the group can also share local knowledge amongst themselves. There is, however, some debate on the effectiveness of information dissemination through groups. In certain instances it has been very effective, while in other circumstances it has been a failure due to conflict over leadership or resources and domination by group members with greater social status or wealth. To overcome this, one needs an understanding of group dynamics and power relations (Adato *et al.*, 2007).

According to Swanson (2008), a new approach in extension is to identify potential enterprises according to the agro-ecological conditions and market access. This is

followed by farmers being organised into groups that specialise in a specific enterprise. It then becomes easier for extension workers to deliver skills and information on a specific enterprise to the participating group members. Once these group members are successful at their specific enterprise, they can then begin to help other farmers to organize themselves – as in farmer-to-farmer extension.The FAO's goals of food security and poverty alleviation align themselves to promoting farmer groups, participating with stakeholders, extension and programmes to train farmers (Rivera*et al.*, 2001).

The Logical Framework Analysis (LFA) technique encourages – and relies on – participation from the people involved in the LFA. The FAO promotes stakeholder participation in the decision-making process of extension programme planning, with the ultimate view of stakeholders taking full responsibility of programme planning. This participatory approach can be seen in various extension approaches such as Farmer Field School Approach, Farmers' Forest Management Schools and Farming Systems Development (Davis, 2006).

Participatory extension is both an instrument and development philosophy. The development philosophy describes the actions of how all participants become involved in attaining their common goal. The instrument part focuses on involving the stakeholders in the decision-making process: analysing their own situation, planning a program, implementing the program and evaluating the program. The decision-making process has an advantage by using the farmers' local expertise and familiarity with the local context. It is also cost effective as well as building the capacity of the farmers themselves. Participatory approaches can be incorporated into an extension system until the point that they are the system itself, such that the participation leads the farmers into taking personal responsibility in addressing their own problems, concerns and interests (Davis, 2006).

Davis(2006) state that extension education and in-service training are essential for an effective agricultural extension system. The agricultural environment is ever-changing, with phenomena such as global warming and globalization, and extension workers need

to stay up to date with current trends so that their farmers can make decisions – with subsequent strategies – regarding their future.

6.2.2 Logframe analysis – Problems and objectives as proposed by small-scale farmers

6.2.2.1 Problem Analysis

South Africa's farming community consists of both predominantly white commercial farmers and predominantly black communal and small-scale farmers. Communal and small-scale farmers are being encouraged to participate in the commercial farming sector. Farmers from the communal areas around Tyolomnqa in the Eastern Cape participated in this research. The farmers identified existing problems that they face in advancing their farming operations. Figure 6.1 exhibits the Problem Tree.

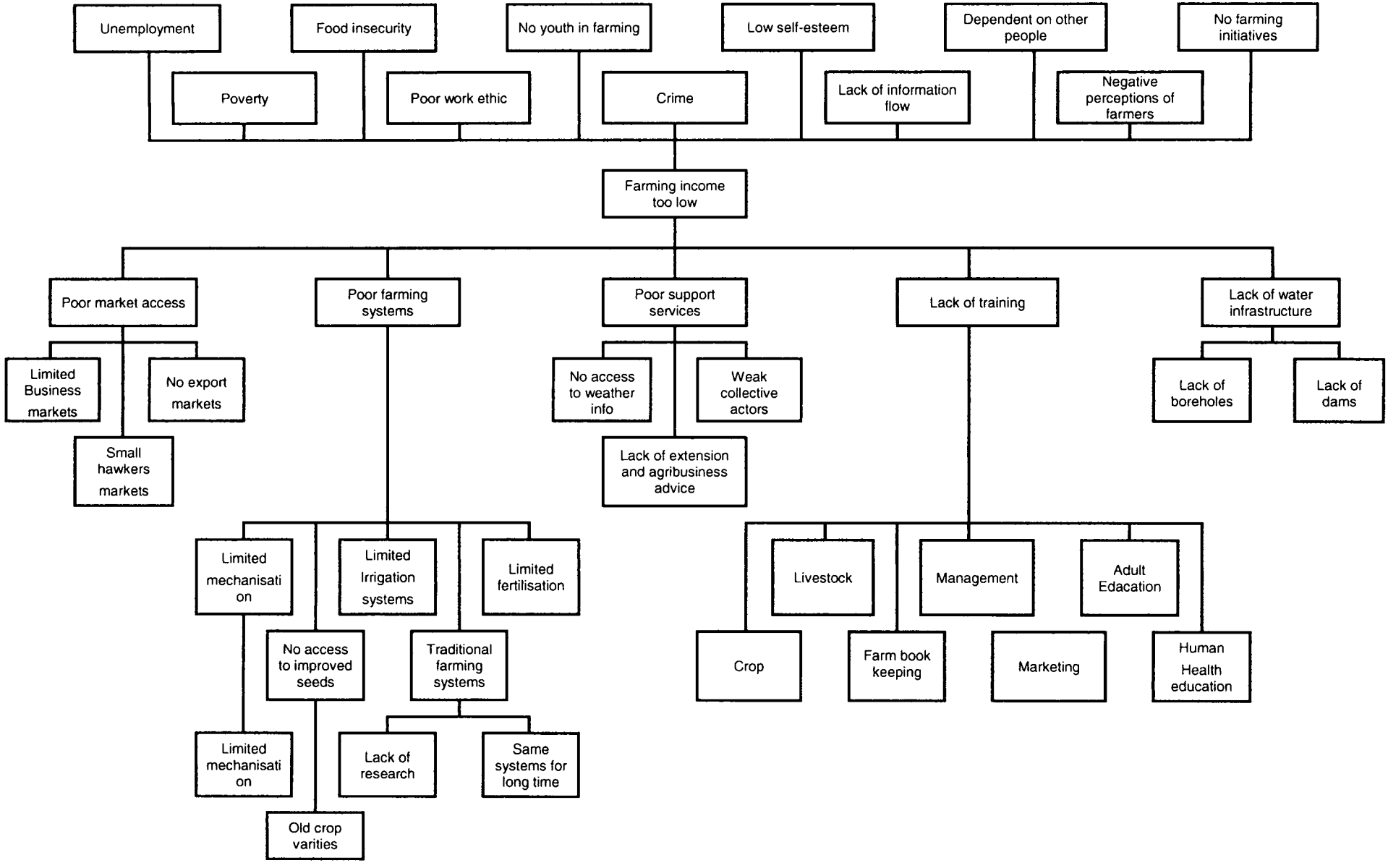

Figure 6.1: Small-scale farmers problem statement (Problem tree)

The core problem focus was ineffective farmer development, which forms the tree trunk in the middle of Figure 6.1. The farmers identified various problems and these problems were divided into causes and effects. The causes become the roots of the Problem Tree and the effects are the branches. The numerous causes were grouped into seven central causes, which have subsidiary causes below them.

The first central cause was inadequate farming systems with subsidiary causes of poorly-performing breeds, unfenced fields, outdated farming systems and lack of fertilizer, irrigation and mechanization. The next three central causes were poor market access, poor work ethic and inadequate financial assistance. Another central cause was poor support services with problems with "red tape" and no access to weather forecasts and climate change predictions. The farmers also identified a lack of water and the associated water infrastructure as a central cause. The last central cause was insufficient training. As subsidiary causes, farmers said they "need more knowledge" and that adult literacy was low. Farmers also said that their agricultural skills were low. This included poor livestock production, poor agronomic skills in ploughing and pest control, and poor management skills that included poor book keeping.

The identified effects of these causes are:

1. Unemployment;
2. Poverty;
3. Food insecurity;
4. No youth in farming;
5. Crime;
6. Lack of information flow;
7. Dependency on other people;
8. Small farming initiatives; and
9. Low income from farming.

6.2.2.2 Objective Analysis

The next phase in the LFA process is to turn the Problem Tree into an Objective Tree. The Objective Tree is used to describe the future situation once the identified problems have been solved. This involves reformulating the negative statements of Figure 1 into positive statements to be achieved in the future. This reformulation needs to be realistic. The logical cause-and-effect relationship is now converted into a logical activity-ends relationship that forms the Objective Tree (Van Rooyen*et al.*, 2002). The Objective Tree is displayed in Figure 6.2.

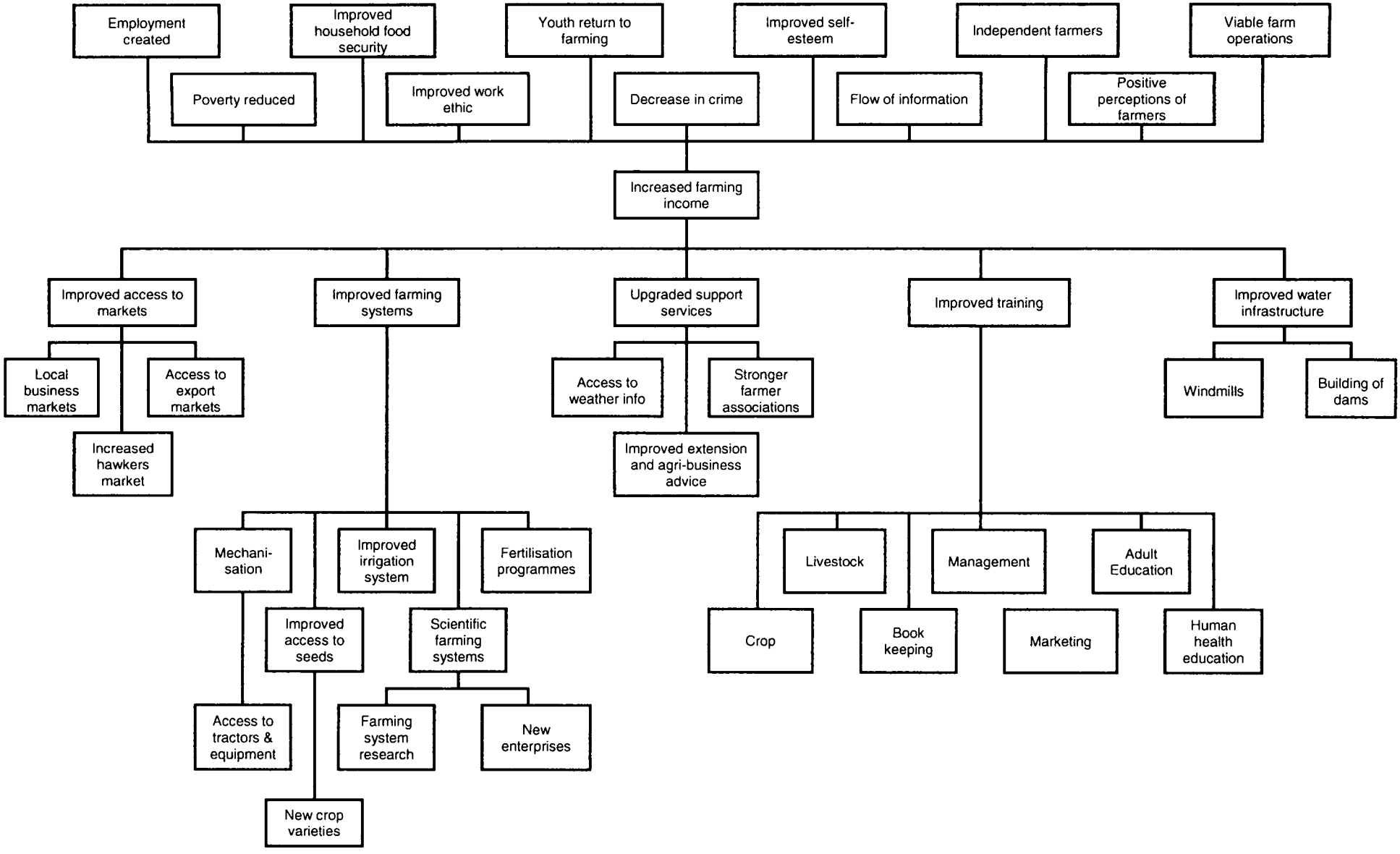

Figure 6.2: Small-scale farmers' views (the Objective tree) and proposals

In the Objective Tree, the trunk is the core objective statement, which is for the farmers to achieve commercial production status or as one member of the research population succinctly put it, "we want to get fat". The rest of the Objective Tree is composed of the activities to reach the objectives as the roots and the branches with the metaphorical fruit are the ends to be achieved.

The farmers identified ten desirable ends. These ends varied from personal ends to societal ends. These ends are, however, all linked. With regards to the farmers' desirable ends, one farmer stated, "we want to be real farmers". This meant that they want people to see that they are sustainable farmers as well as being independent. The farmers also articulated that they want to be self-functioning with stable household food security, and with this, improved health from improved nutrition. The farmers also said that they would like to expand their farming with subsequent increase in income. Above all of this, the farmers want "dignity". Beyond the ends with a personal nature and when these development objectives are met, farmers had societal ends too. These ends included the return of the youth to farming, the creation of employment and the reduction of poverty, and a decrease in crime.

The farmers identified five central activities that they believed would enable them to reach their development objectives. These five central activities are:

1. Improved access to markets
2. Improved farming systems
3. Upgraded support services
4. Improved Training
5. Improved Waterinfrastructure

Access to markets is an activity that will help achieve their objectives and this caninvolve access to local business, hawkers and export markets.

In terms of improved farming systems, farmers said that improving the livestock breeds and fencing the fields would help, as well as correct fertilization and mechanization through irrigation systems and, tractors and the associated equipment. New farming systems such as fish farming could help and this requires farming systems research. The farmers expressed interest in a piggery.

The research population identified support services as a critical activity to reach their objectives. This activity includes access to weather forecasts and climate change predictions, the use of study groups and farmer associations, assistance in conflict resolution, extension and agribusiness advice, and user-friendly "red tape".

Another identified activity is water infrastructure, which includes dams and wind pumps, and as one respondent said, "we need water for more produce, then we will have more income."

6.2.2.3 Analysis of findings

These findings concur with developmental issues of the past. These are socio-economic problems that extensionists cannot address on their own. According to Acunzo *et al.* (2010), agricultural extension has changed from the transference of technologies and diffusion of research to a process known as communication for innovation. The latter aims to involve multiple stakeholders in problem solving and has five steps:

1. Encourage people to identify and acknowledge a problem;
2. Identifying and collecting together the different stakeholders that are affected by the said problem;
3. Working with stakeholders to define ways to affect change, while enhancing the existing communication patterns;
4. Addressing the societal cost of creating the change; and
5. Critically evaluating and reviewing the change and process.

This means that the problems need to be examined within a systems context and addressed as such by a number of role players. This corresponds with an updated

definition of extension that was proposed by Leeuwis (2004). This definition states that extension is "a series of embedded communicative interventions that are meant, among others, to develop and/or induce innovations which supposedly help to resolve (usually multi-actor) problematic situations."

In addition, agricultural innovation systems (AIS) were conceptualized to provide a platform from which a number of role players can interact so that such problems could be solved. The World Bank (2006) has defined AIS as "a network of organizations, enterprises and individuals focused on bringing new products, new processes and new forms of organization into economic use, together with the institutions and policies that affect the way different agents interact, share, access, exchange and use knowledge." These new methods, processes and forms of organization are distributed through a network of various actors in the agricultural environment so that they can help evolve and improve any innovations (Swanson *et al.*, 2010). According to Klerkx*et al.* (2009), the concept of agricultural innovation systems (AIS) had arisen from blending insights from literature on agricultural innovation and industrial innovation. Such a system could help alleviate these socio-economic problems, especially at a policy level.

Similarly, market-orientated agricultural advisory services (MOAAS) advocates a highly diverse range of services to all of the participants in the value chain. MOAAS does not only focus on helping farmers, but rather all the stakeholders involved along the whole value chain. This is because although farmers can be producing sufficiently, if the value chain is not functioning efficiently then farmers will not be able to sell their products or will receive low prices. Thus, all the stakeholders in the system are engaged so that the whole system is running efficiently and optimally(Chipeta *et al.*, 2008).

6.2.2.4 Conclusion

The LFA-enquiry revealed that the smallholder farmers felt that they were not developing as farmers. The research participants felt that this was caused by inadequate farming systems, poor market access, poor work ethic, inadequate financial assistance, poor support services, insufficient training and, a lack of water and associated infrastructure. They felt that the effects of this was unemployment, poverty,

food insecurity, no youth involvment in farming activities, crime, lack of information flow, dependency on other people, small farming initiatives and low income from farming activities.

The participants responded that their desired objective would be to obtain commercial production status. They said that to achieve this they would need to improve their farming systems; have access to training systems, support services, water infrastructure and markets; financial assistance; and have a good work ethic. They said that this would lead to them increasing their productivity with subsequent increases in income; being good farmers and independent; self-functioning with stable household food security; improved health from improved nutrition; youth returning to farming; and creation of employment, reduction of poverty and a decrease in crime.

The problems they face and the solutions they seek cannot be solved by the farmers themselves or with the help of an extensionist. These problems relate to the agricultural system and require a broad range of role players to help in rectifying this situation. At present, the public agricultural extension model does not have the capabilities to solve this dilemma as too few of the role players are consulted. It is suggested that an improved model, which consults all of the role player in the agricultural environment, would be more effective. More research is needed before one can make any concrete conclusions about an improved model.

6.3 ANALYSING EXTENSION WORKERS' VIEWS AND PERCEPTIONS[3]

6.3.1 Introduction

The South African agricultural extension service is challenged to improve food security, develop the rural areas through agricultural activity and create sustainable jobs in farming. This is essentially through the transfer of information and technologies to farmers in order to increase sustainable agriculture. According to Mudau *et al.* (2009), recent policy formulation has introduced the Extension Recovery Plan (ERP), which aims to energise the extension service and bring it new hope as in the past the extension workers felt dejected as they were uncertain about their future and the future of extension. The ERP was informed by the need to overhaul the extension service and it is based upon five pillars, which are:

1. Ensure accountability and visibility of extension;
2. Promote professionalism and improve the extension image;
3. Re-skilling and orientation of extension workers;
4. Provision of infrastructure and other resources; and
5. Recruitment of personnel.

According to Swanson *et al.* (2010), there are three major agricultural development goals at the national level and these determine the activities of the extension system. The development goals are to (1) achieve national food security, (2) improve rural livelihoods and (3) improve natural resource management. The activities required by the extension service to reach these goals overlap. To achieve short-term food security, the

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[3] This research as an integral part of this PhD study was accepted for publication in the South African Journal of Agricultural Extension:
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extension service needs to transfer technologies that will increase staple food crop production. To improve rural livelihoods, the extension service must help farmers increase their farm income by increasing the production of high-value products, diversifying their farming systems and organizing farmers into producer groups to increase their market access. Lastly, to improve natural resource management, the extension service must train farmers in sustainable natural resource management practices and this will help achieve long-term national food security.

In this context and according to Van den Ban *et al.* (1996), the definition of agricultural extension is that "extension involves the conscious use of communication of information to help people form sound opinions and make good decisions". This definition has become outdated and the following definition proposed by Leeuwis (2004) is used in this chapter as it takes into account the various new developments in the field of agricultural extension. This definition states that extension is "a series of embedded communicative interventions that are meant, among others, to develop and/or induce innovations which supposedly help to resolve (usually multi-actor) problematic situations."

A holistic approach will be taken by this enquiry, informed by recent policy statements (Bese, 2010) and discussions with the leadership of extension in the Eastern Cape's Department of Agriculture (ECDoA), and also by attending to the views and perceptions of other important stakeholders and role players.

In this study a representative selection of ten practicing extension workers, from around the Amatole District Municipality of the Eastern Cape, were selected by the District Manager of this municipality and were required to describe the current extension system in the Eastern Cape and what role they perceive to play in agricultural extension.

The first aspect was achieved through a SWOT analysis with the extension workers. The second aspect, i.e. what role the extension workers should/could play was explored through a Logical Framework Analysis (LFA). On this premise, the LFA enquiry is founded on constructivism whereby the process facilitator assists multiple participants in reconstructing a problem into a solution around a logical consensus (Denzin *et al.*,

1994). The aim of this LFA enquiry is to analyse, plan, implement and evaluate any intervention in order to improve efficiency and effectiveness (van Rooyen *et al.*, 2002).

The LFA is based on intervention logic of goals and the required objectives, results and sets of activities, and is conducted in a formal planning process (van Rooyen *et al.*, 2006). According to van Rooyen *et al.* (2002), this tool is essentially used to clarify cause-effect relationships as well as clarifying logical links "between inputs and objectives; activities and outputs; broader purposes and the ultimate goals" that the tool was meant to serve. This tool is therefore a systematic planning process that is based on logical deductions (van Rooyen *et al.*, 2006).

This process revealed the perceptions of the extension workers regarding their core objective or mission as well as the outcomes they envisaged would be accomplished when the core objectives were met. The activities or programmes that need to be performed for the core objectives and subsequent envisaged outcomes to be achieved were also identified by the extension workers.

6.3.2SWOT Analysis

6.3.2.1 Strengths

The extension workers identified the following as their strengths:

1. Farmer development through group sessions and demonstration trials. Transferring information to farmers through regular interactions as above and instilling new ideas to farmers and thus improving their farming skills;
2. Participative action through working with people on the ground and involving them in the development process;
3. Service delivery through the regulation and management of government support programmes;

4. Well structured service with suitably qualified officials (both extension and senior officials); and

5. To provide support to policy formulation.

6.3.2.2 Weaknesses

The following weaknesses were identified by the extension workers:

1. Ineffective management with poor implementation of policy formulation as well as a top-down approach;

2. Being a "jack of all trades and master of none" as there is no specialization;

3. Scarce resources, including finances, for farmer development; and

4. Poor communication with farmers and within the service.

6.3.2.3 Opportunities

Several opportunities were identified, these are:

1. Improvement of knowledge through training provided, thus assisting people to move from point A to point B in their development;

2. Increase in production and hence, increases in food security;

3. Easy access to other agriculturally-related industries; and

4. Good communication skills with farmers.

6.3.2.4 Threats

Threats that were identified included:

1. Lack of technology and information for extension workers, such as the prevailing weather conditions;
2. The development of unproductive farmers who cannot be commercial farmers;
3. Competition between other departments and NGO's in the same areas;
4. Political will to effect change as well as interference of politicians into technical aspects; and
5. Too many bosses, thus making you not able to work according to your programme.

6.3.2.5 Analysis

From the above, one can conclude the following about the state of affairs in the Eastern Cape's extension service. Firstly, the extension service has strengths in farmer development, participative action, implementing government support programmes, has suitably qualified personnel and can support policy formulation.

Secondly, the extension service has some inherent weaknesses, such as lack of effective management, top-down approach within the service, lack of specialisation, scarce resources for development efforts as well as poor communication within the service and with farmers. According to a World Bank report (2006), the top-down approach that is generally used by most extension services globally is seen as farmers being passive clients instead of being active participants. One can therefore conclude that this is not the extension workers' fault as extension efforts are passed down from higher management levels; hence the so-called top-down approach.

Thirdly, the extension service has several opportunities for improvement. These include assisting in development through transfer of knowledge and training so that production

will increase. The service also has access to agri-industries and potentially good chances of effective communication. According to the same World Bank report (2006), new communication technologies have been found to be important drivers of change and will continue to be so into the future.

Lastly, the service identified threats that included lack of information and technologies for extension workers, development of unproductive farmers, competition between other public departments and NGO's, political interference and too many bosses. The said World Bank report (2006) also stated that there is often a lack of operational resources, effective planning, monitoring and evaluation of extension activities, and the low impact of extension services that is partly due to inappropriate innovations being distributed. In terms of developing unproductive farmers, a farmer-typology analysis would be useful.

According to the Christoplos (2010), the FAO has recognised the need to mobilise the extension service to achieve a range of goals for rural development. These goals can be achieved when weaknesses are turned into strengths, opportunities are made the most of and threats are neutralised; these goals include:

- The enhancement of people's access to technologies and information on these technologies;
- The ensuring that farmers and actors in value chains can cope with changing markets;
- The enablement of farmers to understand climate change as well as mitigate and adapt to the new challenges;
- The support of rural communities in effectively managing their natural resources; and
- The assistance to farmers to use their available resources optimally so that they have access to food and income.

6.3.3 Problem Statement Defined by the Extension Workers

The extension workers involved in this research identified the following as their core problem (see Problem Tree in Figure 6.3) and this is that they are unable to effectively transfer information and technologies through communication and are therefore unable to mobilise farmers to becoming commercially viable. The cause-effect relationship of their problem can be seen in Figure 6.3 where the causes are the metaphorical roots and the effects are the metaphorical branches of the tree.

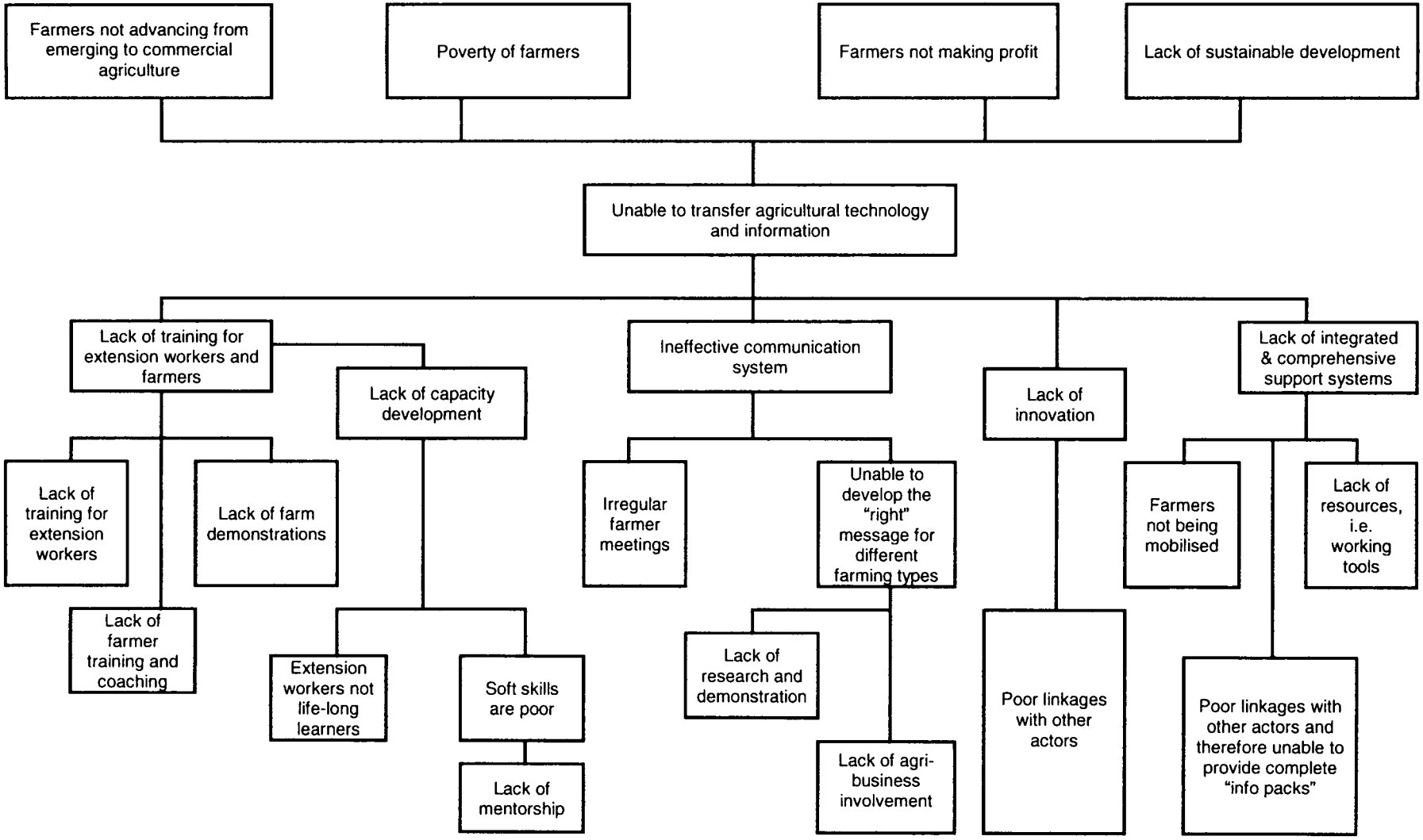

Figure 6.3: Extension Workers' problem statement (problem tree)

6.3.4 Core Objectives of Agricultural Extension

In order to solve their problems themselves, the Problem Tree was converted into a positive statement whereby an Objective Tree (Figure 6.4) was prepared. Their core objectives or mission, as identified by the extension workers, revolved around three key concepts "to transfer, communicate and mobilise". This was interpreted as "the imparting of agricultural knowledge to farmers, for them to be able to optimise their production in a sustainable way and to enable them to achieve food security initially and to later develop to commercial production. This statement was refined to the training and developing of farmers' skills in agriculture so that they can produce quality food to alleviate poverty. The Objective Tree can be seen in Figure 6.4 and this is discussed thereafter.

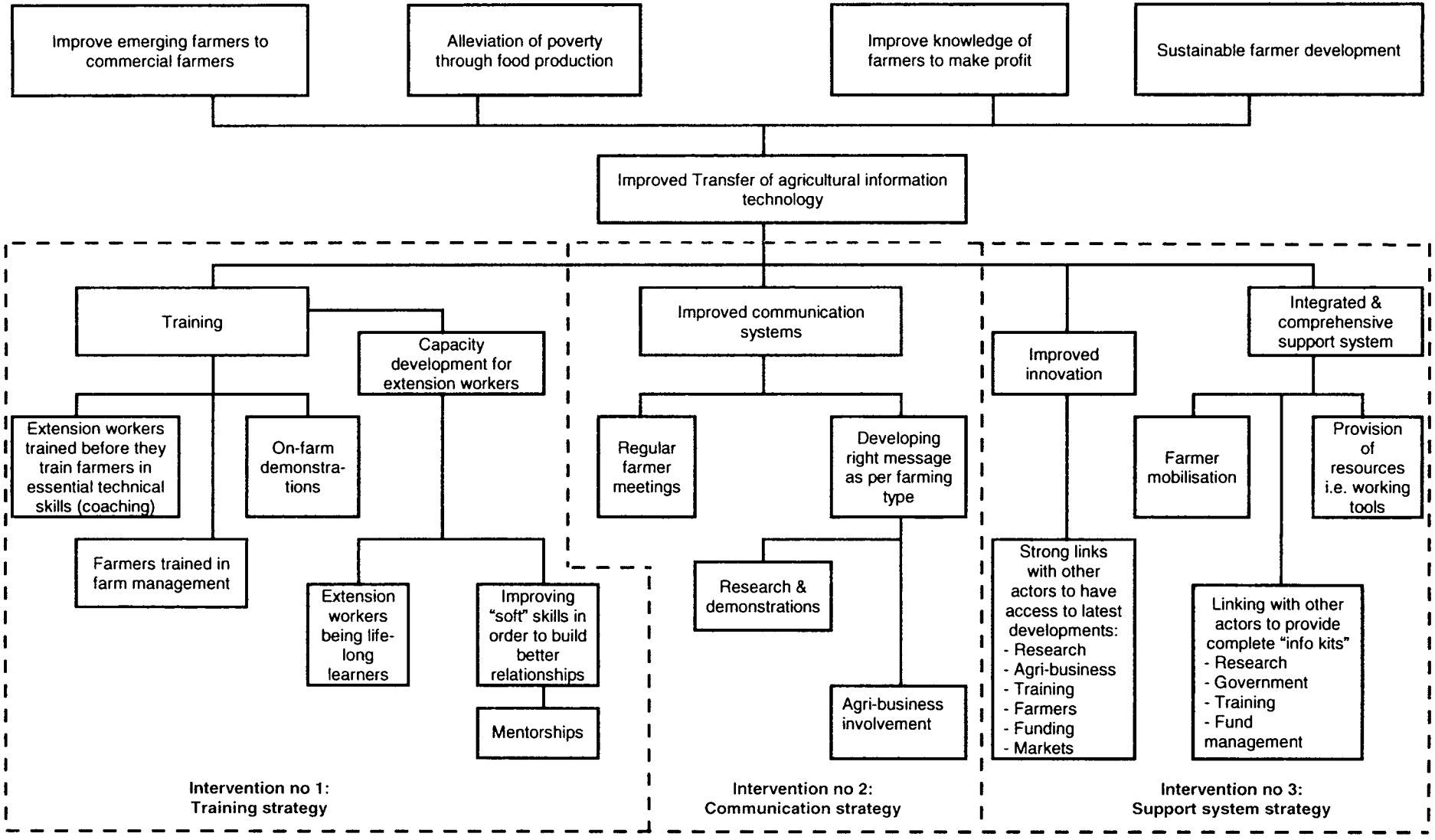

Figure 6.4: Extension Workers' views and proposals(Objective Tree)

6.3.5 The Envisaged Outcomes of the Extension Workers' Efforts

The extension workers envisaged four outcomes that would be achieved once the core objectives were met. These outcomes are:

1. To develop emerging farmers to be commercial farmers and to shift farmers from subsistence to commercial farming. According to Swanson (2008), due to economic growth in developing countries, there are opportunities for smallholder farmers to increase incomes by diversifying into high-value farm products, but this will require these farmers to learn new production and management techniques (human capital development); and

2. To alleviate poverty in their society through food production. According to Rivera *et al.* (2001), farmers need to be convinced that the extension service is communicating valuable information for income generation and improving their living standards. The extension service must therefore supply appropriate innovations in this regard;

3. To develop farmers so that they can make a profit out of farming and thereafter improve their standard of living. According to Pesche *et al.* (2007), the extension service can help by improving farming and farm yields so that farmers can become empowered and support their livelihoods;

4. Sustainable farmer development focussing on poverty alleviation and job creation by means of implementing the five pillars of sustainability. According to Dumanski (1997), the five pillars of sustainability revolve around social equity, economic viability, maintenance of productivity levels, protection of the environment and reduction of production risks.

6.3.6 Programmes and Activities

The extension workers identified five core activities that needed to be fulfilled in order to reach the objectives and desired outcomes. These five activities had sub-activities that needed to be accomplished before a specific activity's goals could be achieved. The five core activities were then grouped into three intervention strategies. These three intervention strategies of the five core activities and their sub-activities are:

6.3.6.1 Intervention no.1: Training strategy

Activity 1: Training:

1.1 Extension workers need to be trained before they train the farmers. This could be achieved through continuous or short-course training.

1.2 The farmers needed training in farm management, which included book keeping, decision making, marketing, financial skills, time management and risk management.

1.3 On-farm demonstrations should be used as a training tool.

Activity 2: Capacity development:

2.1 Extension workers being "life-long learners".

2.2 Improving their soft skills, in other words, being able to build good social relationships.

There are different types of training that occur. There is pre-service training which occurs before one gets a job appointment. The next type of training is, in-service training, which is training that occurs while employed, this occurs outside of the work environment. On-the-job training is training that occurs while working and it is within the workplace. The last type of training is orientation training which entails the training of new employees about the philosophy and norms of the organization. These various types of training are important in extension services as it allows extension workers to

improve their skills and attitude, and to learn about new extension techniques. The type of training needed needs to be identified and this can be achieved through the evaluation of the extension workers' efforts (Jibowo et al., 2008).

According to Rivera, et al (2001), pre-extension education and in-service training are essential for an effective agricultural extension service. The agricultural environment is ever-changing, with phenomena such as global warming and globalization, and extension workers need to stay up to date with current trends so that their farmers can make decisions – with subsequent strategies – regarding their future.

Training has been defined as the acquisition of specific skills, knowledge or attitude that can be used within specific situations. In a broad sense, training starts with acquiring knowledge about specific processes that occur within the extension field. This is followed by working under an experienced worker to acquire the necessary skills so that the various processes can be used effectively. Lastly, the required attitude needs to be developed in order to become an effective extension worker (Jibowo et al., 2008).

This type of training is known as human capital development whereby personal knowledge and competencies are increased as well as improvements in attitude and behaviour. In the past, this type of development has been ignored in favour of improvements made to institutions and infrastructure. However, research conducted in East Asian countries has shown that the countries that developed their human capital were the ones that experienced faster economic development. This is, however, a long-term investment that requires continuous support (Jordaan, 2008).

Another type of human capital development is the improvement of soft skills. Soft skills can be defined as a nurturing process whereby the knowledgeable extension officer befriends, encourages and teaches farmers. This is performed for the purpose of promoting the development of the farmer and farm. In the same context, the extension officer can use these soft skills to network with the other actors in the extension environment too.

Training is not only about human capital development, it also requires a knowledge support system with relevant training material that extension workers can be trained in.

This requires partnerships between various actors in the extension environment (Jibowo et al., 2008); these partnerships will be further discussed under Intervention Strategy 3.

6.3.6.2 Intervention no. 2: Communication strategy

Activity 3: Improved communication systems:

3.1 Regular farmer meetings.

3.2 Developing the "right" message, this entailed respecting local indigenous knowledge and understanding the farming systems (typology analysis).

Dagada et al. (2007) found that communication is required within all agricultural activities.It has been recommended that communication channels between extension workers and farmers need to be enhanced so that farmers can gain skills and knowledge for ensuring sustainable resource management. Tsheole *et al.* (2008) found that improved communication would lead to an improvement of access to agricultural support services by farmers.

6.3.6.3 Intervention no.3: Support system strategy

Activity 4: Innovation:

4.1 This activity could be accomplished if the extension officers had strong linkages with agribusinesses, top commercial farmers and research stations. In this way the extension workers will be in a position to have access to the latest developments in agricultural innovations and technologies.

Activity 5: Integrated support systems:

5.1 Farmer mobilization, which consisted of "farmers must be ready to adopt new ideas introduced to them" and extension officers should link up with farmer associations

5.2 The extension workers must link up with researchers, agribusinesses and subject-matter specialists so that the extension workers can provide complete "information packs".

5.3 The provision of resources, which consisted of access to working tools and the implementation of farmer contact sessions.

In terms of innovation, improved communication would lead to an improvement of access to agricultural support services by farmers (Tsheole *et al.*, 2008). The same holds true for extension workers linking with other actors. Support systems within the extension organization are presently unable to keep abreast with the latest technologies and market demands that are necessary to keep South African farmers and the agricultural sector ahead of global competition. This is especially true with regards to the needs of the small-scale farmers of the Eastern Cape Province. These farmers form the majority of the land users in this province (Lategan *et al*, 2006).

With respect to farmer organizations, it has been found that successful cooperatives have strong links with the extension service, which leads to better functioning of the cooperatives and would ultimately lead to the betterment of the farmers (Dagada *et al.*, 2007). Cooperatives that are effective can play a large role in helping farmers in having effective contact with the extension service, acquiring bargaining power and becoming commercial farmers.

A knowledge support system is required, with relevant training material that extension workers can be trained in. This requires partnerships between various institutions such as universities, government, non-governmental organizations, extension workers and the communities concerned. Different partners have different skills with each skill contributing to extension work. In this way there is a flow of knowledge from the various institutions to the extension workers which will ultimately help the farmers (Jibowo *et al.*, 2008).

Van Rooyen *et al.* (1998) differentiated between the support needs of commercial and emerging farmers, and the needs of non-commercial or subsistence farmers. Therefore three types of research are needed, namely research for (1) commercial, (2) emerging

and (3) subsistence farmers. Research should take into account the needs of the various types of farmers.

Support consists of technical information and skills training for extension workers. Support is supplied firstly by the extension service as well as by universities, colleges, the Agricultural Research Council, cooperatives and by national and provincial government-agricultural departments. There are a variety of proposed agricultural development programs in South Africa. Although a variety of programs exists there is insufficient support that would facilitate such programs. Relevant research is needed and should flow to extension workers so that they in turn can pass this information to farmers (Lategan *et al.*, 2006).

Researchers form part of a team in which they supply extension workers with information. Extension workers in turn supply the farmers with information on the research. This process is termed technology transfer and it does not only flow from researcher to farmer, but also in the reverse direction as the farmers' problems are taken by the extension workers to the researchers to solve (Bembridge, 1991).

The technology transfer process is fundamental to sustainable rural development as farmers need to improve their farming operations. They can achieve this with relevant and timely information. Extension workers need to facilitate access to such information and they need to be supported by the various research institutions for this information (Van Rooyen *et al.*, 1998).

The Programmes and Activities are fully analysed in Table 6.1 (The Logical Framework Matrix), whereby the Intervention Logic, the Objectively Verifiable Indicators, the Sources of Verification and Assumptions as well as the Resources and the sources of funding needed to implement the activities required to reach the Core Objectives of Agricultural Extension as envisaged by the extension workers in the focus group.

According to van Rooyen, *et al.* (2006), the Intervention Logic is a narrative summary of the Objective Tree and consists of the goal, the purpose, the intermediate results and the activities. The goal is the envisaged outcomes that will result when all of the interventions are met. The purpose (or core objective) is the desired state that is

targeted by the project intervention. The intermediate results are the desired intermediate situation that will be brought about by the intervention and all of these together aims at achieving the purpose. The activities are actions that need to be carried out so that the intermediate results can be achieved.

The second column has the Objectively Verifiable Indicators. These are operational terms that describe the goal, the purpose and the intermediate results; that is, in terms of quantity, quality, place and time. Indicators are milestones that describe the progress being made and allow for effective monitoring. The second column also shows the resources that are needed to carry out the activities that are planned. The third column shows the Sources of Verification. This column shows what information is needed to verify progress towards attaining the goal, the purpose and the intermediate results. The third column also shows the costs of carrying out the activities and the source of these funds. The fourth column shows the Assumptions. The assumptions are external factors that the intervention has no direct control over, but these are nevertheless important to consider as they have a bearing on the achievement of the goal, the purpose and the intermediate results. The intervention leader cannot be responsible for the assumptions, but must always be mindful of them, monitor them, take account of them and when possible, try to influence them (van Rooyen, *et al.*, 2006).

Table 6.1: Extension Workers' Logical Framework Matrix

	1	2	3	4
	Intervention Logic (IL)	**Objectively Verifiable Indicators (OVI)**	**Sources of Verification (SV)**	**Assumptions (A)**
Goals	1. Effective extension 2. Develop commercial farmers 3. Create jobs & alleviate poverty	1. Extension workers in the field 2. Productive farms 3. Jobs created, less poverty	1. Surveys 2. Surveys 3. Stats SA / Financial records	1. Extension workers are motivated 2. Farmers want to become commercial
Purpose	To transfer technologies, communicate & mobilise farmers	Farmers adapt prescribed technologies	Surveys	Farmers are motivated
Intermediate Results	Strategy 1: Training	Courses are available	Attendance register at courses	Extension workers and farmers want to attend courses
	Strategy 2: Capacity development	Developmental opportunities are available	Attendance register	Trainers are available
	Strategy 3: Improved communication systems	Green book of Extension workers	Surveys	People want to communicate and interact
	Strategy 4: Innovation	Farming methods are improved	Records of various innovations Surveys	Relevant innovations are available Actors want to interact
	Strategy 5: Integrated support systems	Green book of Extension workers	Surveys	Actors want to interact
		Resources	**Cost**	
Activities	1.1 Extension workers trained before training farmers through continuous/short courses 1.2 Farmers trained in farm management 1.3 On-farm demonstrations	Courses Class material Lecturers	Donors Government Universities NGO's	
	2.1 Extension workers being life-long learners 2.2 Improving "soft" skills to build better relationships	Courses Specialists	Donors Government	
	3.1 Regular farmer meetings 3.2 Developing the right message, while respecting ITK & understanding farmer typology	Venue Skills	Government	
	4.1 Strong links with other actors to have access to latest developments	Innovation broker	Government	
	5.1 Farmer mobilization 5.2 Linking with other actors to provide complete "info packs" 5.3 Provision of resources, i.e. working tools	Skills Innovation broker Working tools	Government	

6.3.7 Analysis of the Logical Framework Matrix

If the core function of extension is to facilitate and direct the transfer of agricultural knowledge that is required to farm effectively; thus being said, the extension worker must link farmers to the relevant actors (agribusinesses, NGO's, parastatals, researchers) in the agricultural environment that will meet their immediate need. In order for extension workers to fulfil their role, the required activities need to be carried out so that the interventions are achieved. This means that the required resources need to be made available as well as the funding from the various sources also need to be made available.

6.3.8 Conclusion

From this analysis the extension workers determined that their core objective is "to transfer, communicate and mobilise farmers" although they could not achieve this objective presently. They suggested that five core activities were needed to improve the extension service. These activities were training, integrated support systems, innovation, improved communication systems and capacity development; with each of these activities having sub-activities.

Once these activities have been holistically achieved, their envisaged outcomes of this were the alleviation of poverty, the profitability of farming increases, farmers develop from subsistence and emerging status to commercial farmers and that agriculture becomes more sustainable. The conclusions from this research will be used to redesign the Eastern Cape's public extension service, but the views of farmers (clients) and supporting system (agribusinesses, etc.) must be sought to formulate a well considered perspective and independent view of "where to" as the extension workers seem somewhat "trapped".

6.4 ANALYSING VIEWS AND PROPOSALS OF AGRICULTURAL SUPPORT SYSTEMS[4]

6.4.1 Introduction

According to Van Rooyen's *et al.* (1998) Human Capital Development matrix (Table 2.1, Chapter 2), there is a wide array of actors involved in the agricultural environment that play different roles in developing human capital products.

However, agribusinesses should be included as they play a large role in the food production system. This begins with supply of production inputs and services and continues after production with processing, marketing and distribution, which are all necessary to satisfy the consumer (Jere, 2002). This view of including agribusinesses is supported by Swanson *et al.* (2010). Thus this section enquires after the perceptions of agribusiness actors and agricultural economists, who can collectively be called the agricultural support system actors.

Having said this, the extension service serves the farmers in conjunction with agribusinesses and farm management actors as well as research and scientific actors (subject-matter specialists, such as soil scientists, agronomists, etc.). This latter link was explored in chapter 5 dealing with this research (to consider a more effective agricultural extension service model for the Eastern Cape). The major findings revealed the perceptions – regarding eight factors for effective extension – of extension officers and, research and scientific actors. Their perceptions were often misguided as both groups ranked communication very low for effective extension. It was concluded that these eight factors need to be developed through either human capital development or organizational development and this will start to lead to extension being more effective (van Niekerk *et al.*, 2009).

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[4] This research as an integral part of this PhD study was accepted for publication in the South African Journal of Agricultural Extension:
Van Niekerk, J.A., Stroebel, A., Van Rooyen & Swanepoel, F.J.C.
SAJAE Vol. 39 No. 2, 2011.

The previous research focus on the views and perceptions of agricultural extension workers and smallholder farmers. The major findings from the research with the extension workers revealed their perceptions regarding the problems they face within the extension service as well as potential solutions to these problems. The major findings from the research with the smallholder farmers revealed the problems they were facing as well as solutions they envisaged that would solve their problems.

This researchin chapter 6.4 explores the link between the government's extension service and the agricultural support system, in particular farm management services and agribusinesses (input suppliers, processors, marketers, etc.).

The commercialization of smallholder farmers requires linkages with markets and support systems that need to be mobilized by the agricultural extension service, which includes farm management, marketing and agribusinesses. According to extension workers (refer to previous section), such networks are complex to mobilize sufficiently. The questions could even be asked if (a) smallholder agriculture can produce sufficient business opportunities for agribusinesses; and (b) whether extension workers have a facilitative role to play in this context.

In this study, ten actors from the agricultural support system – this was comprised of actors from agribusinesses and agricultural economists from the Eastern Cape Department of Agriculture (ECDoA) – were required to express their perceptions on whether smallholder agriculture offers sufficient business opportunities for agribusinesses and whether extension workers have a facilitative role to play in linking smallholder farmers to agribusinesses.

This process revealed the perceptions of the actors from the agricultural support system regarding the business opportunities offered by smallholder agriculture as well as the role that extension workers should play in linking the agricultural support system to smallholder farmers. This was represented in these actors' view of the core objectives for extension workers, the envisaged outcomes that would be accomplished when the core objectives were met, and activities that are required to be performed so that the core objectives and envisaged outcomes can be achieved.

6.4.2 Problems identified by agri-support services (Problem Tree)

Figure 6.5 (below) exhibits the Problem Tree: Agri Support System. In the middle of the tree (the trunk) is the core problem as envisaged by the actors in the agri support system. Below the trunk (the roots) are the causes of the problem and above the trunk (the branches) are the effects that are caused.

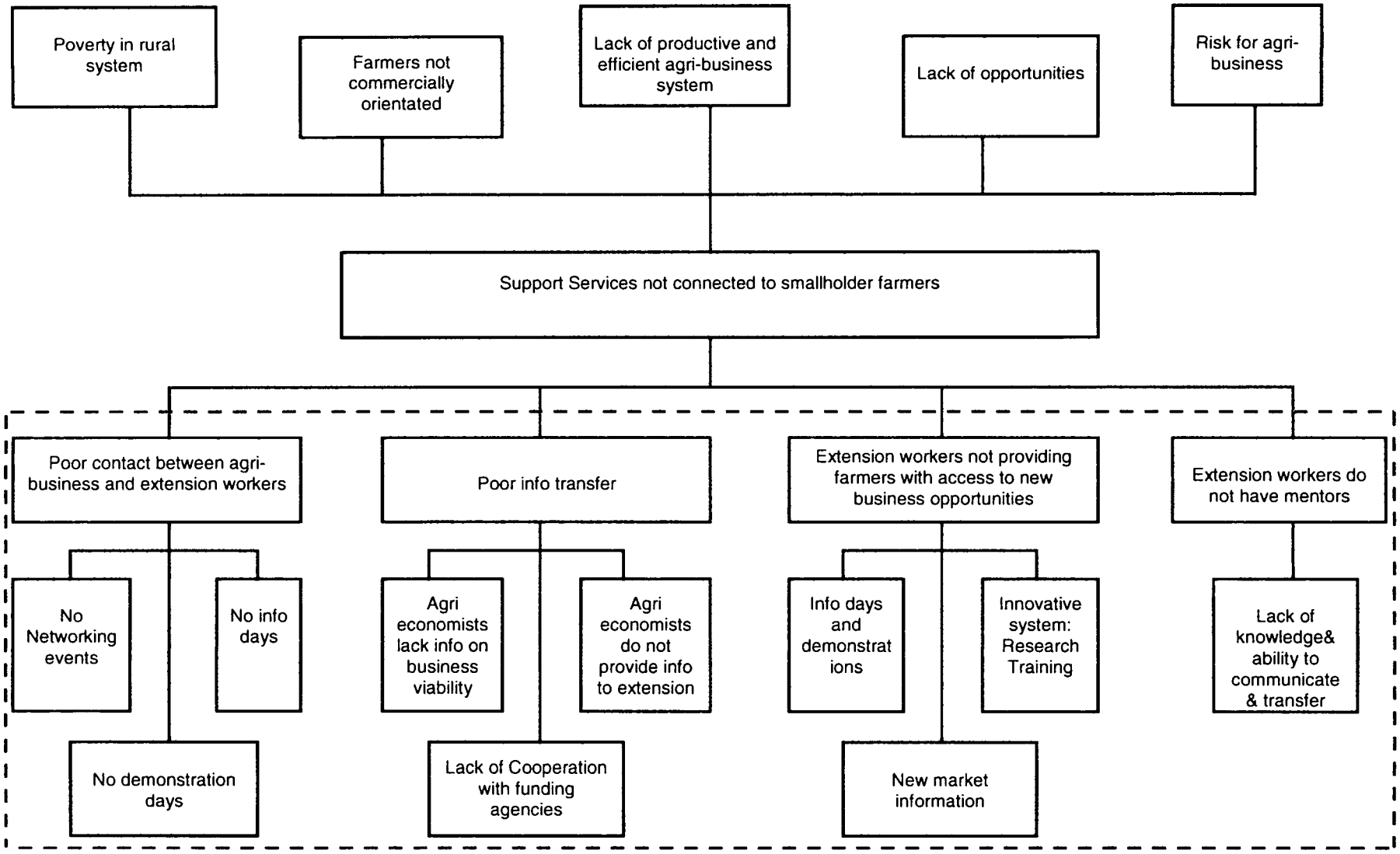

Figure 6.5: Problems stated by Agri Support Services (Problem Tree)

6.4.3 Objectives of Agri Support Services

Figure 6.6 (below) exhibits the Objective Tree: Agri Support Services, which is in effect, the Problem Tree turned into a positive statement. With the trunk being the core objective or goal, the trunk is being the envisaged outcomes and the roots being the required activities to reach the desired outcomes. This is broken down into further details below.

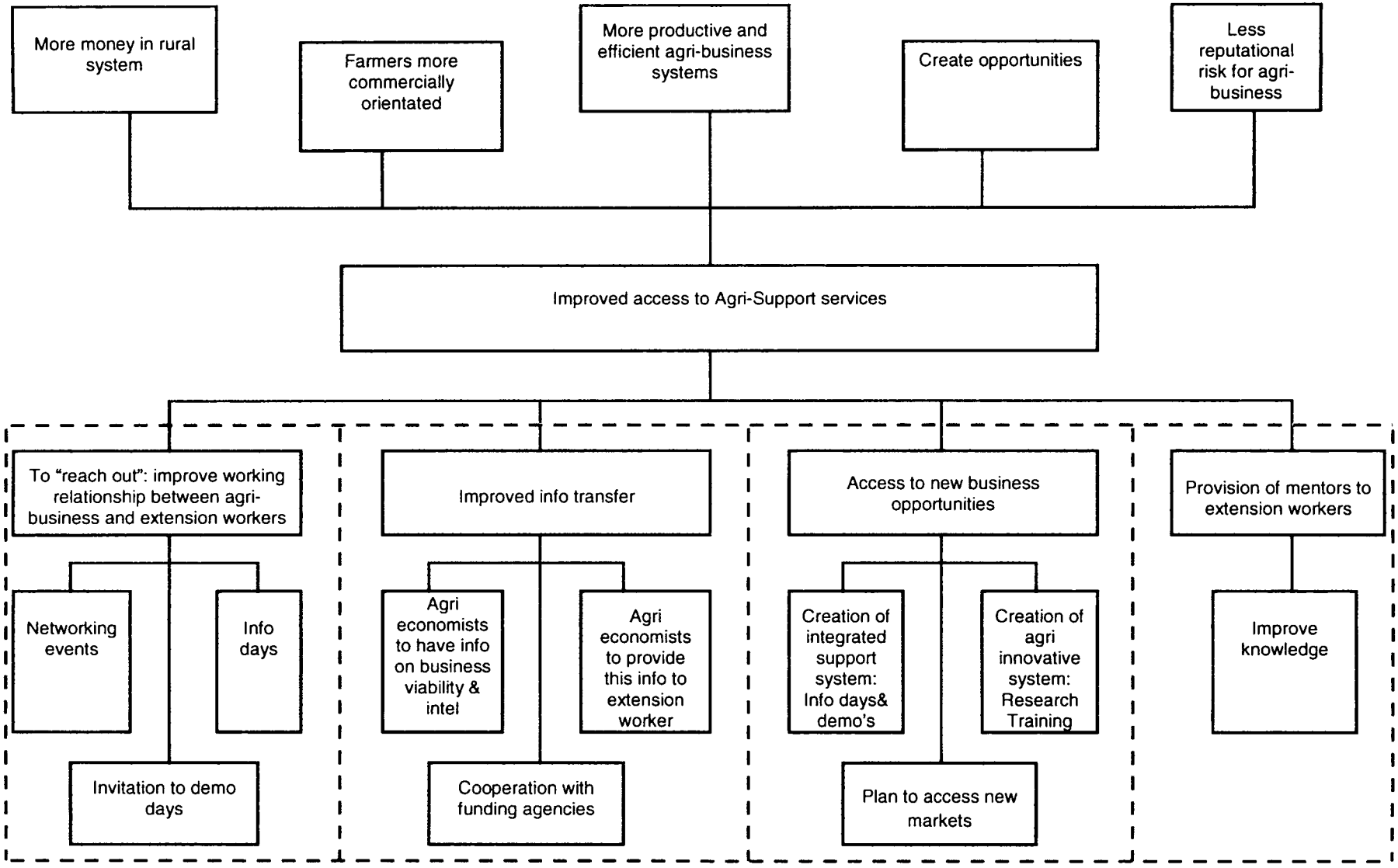

Figure 6.6: Objectives of Agri Support Services (Objective Tree)

6.4.4 The Core Tasks or Mission of Agricultural Extension as Viewed by the Agricultural Support Services

This is comprised of what agribusiness actors believe what the core task or mission of extension officers is. Their response consisted firstly that the extension officers should act as a conduit between large numbers of smallholder farmers and the available services and business environment and secondly that the extension workers need to be regularly in the field with the farmers to activate the required services at the required time.

The core focus can thus be viewed as the mobilising of a large number of smallholder farmers and facilitate the communication and transfer of information and business requirements. Thus the extension workers must be "brokers" of agricultural knowledge, should transfer agricultural knowledge to farmers and they should disseminate information on various aspects such as production, marketing and new developments.

This view confirms to a large degree the views of all the other role players, i.e. scientists (van Niekerk *et al.,* 2009), farmers and extension workers. From this a generic definition of the agricultural extension service can be defined as "a series of embedded communicative interventions that are meant, among others, to develop and/or induce innovations which supposedly help to resolve (usually multi-actor) problematic solutions" (Leeuwis, 2004).

6.4.5 The Expected Outcomes of the Agricultural Extension Service

The actors from agribusiness envisaged five outcomes that would be realised if the extension workers effectively played their role as discussed in the above chapter. The outcome or visions are:

1. More money in the rural system;
2. Farmers being more business focussed with more commercially-orientated agriculture;
3. More productive and efficient agribusiness systems;

4. The creation of opportunities for farmers
5. Less reputational risks for agribusinesses.

6.4.6 Roles and Activities

The focus group responded with four key activities or programmes that once accomplished would help the extension workers fulfil their core objectives and ultimately the outcomes or vision of effective agricultural extension efforts. These key activities or programmes, in terms of the agricultural-economics aspect of extension, are:

1. To "reach out", with respect to improving the working relations and engagement between agribusinesses and extension officers;
2. To have access to information on business viability and intelligence (information transfer);
3. To provide access to active and integrated support systems (mobilization); and
4. Provision of mentors to extension workers.

Reaching out: The first activity of "reaching out" to improving the working relationships between agribusinesses and extension workers relied upon four sub-activities, which are: joint training involving agribusinesses, extension workers and farmers; conducting workshops and information days; on-farm demonstrations; and study groups.

Information transfer: The second activity of access to information of business viability and intelligence involves four sub-activities, these are:

1. Economists should provide extension workers with advice on viability and profitability of specific farms as well as giving advice on marketing strategies;
2. Extension workers should work hand-in-hand with agricultural economists for marketing information and business plans. Agricultural economists should also assist extension workers in determining the economic viability as well as progress of specific farms;
3. The extension worker needs to understand the economics of the different farming systems and thereafter provide information or help that is needed accordingly.

Agricultural economists and farming-systems analysers would need to assist in this regard; and

4. The risk profile of the different agricultural production systems needs to be determined. Thereafter risk mitigation strategies can be formulated.

Mobilization: The third activity of having access to an active and integrated support system revolves around the statement of one participant who said: "they need to be in contact with someone that can help and advise them". The holistic achievement of this activity relies on three sub-activities, these are:

1. Extension workers having access to subject-matter specialists, such as soil scientists, agricultural economists, marketing specialists and legal advisors with regards to the farming systems. Extension workers should be objective with regards to the different viewpoints of the respective specialists according to the farming system at hand;
2. Advice to the different kinds of agricultural-farming systems should be available or provided; and
3. Training of extension workers should be provided as well as extension workers being exposed to the different aspects of the agricultural environment, such as the marketing environment while working closely with marketing specialists and agricultural economists.

Leadership and mentoring: The fourth activity is the provision of mentors to extension workers. Mentors in this regard, can be top commercial farmers in a specific field, subject-matter specialists, researchers and actors from agri-businesses. In order for extension workers to fulfil their roles as outlined their core objectives as well as achieving the outcomes of effective extension efforts described above, the extension workers need to reach holistic achievement of the four outlined activities described above.

Table 6.2: Agri-Support Service Logical Framework Matrix

	Intervention Logic (IL)	Objectively Verifiable Indicators (OVI)	Sources of Verification (SV)	Assumptions (A)
Goals	1. More money in rural system 2. Meeting government targets 3. Farmers more business focussed & more commercially orientated agriculture 4. More productive & efficient agribusiness systems 5. Better food security 6. Less reputational risk for agribusiness	1. Improved livelihoods 2. Targets met 3. More high value crops, intensive livestock production & value adding 4. More farmers using agribusiness products 5. Food secure households 6. Better investment opportunities	1. Research 2. Survey by extension officers 3. Survey by extension officers 4. Survey by agribusiness reps 5. Research 6. Economic development, surveys of agribusiness	1. Development of value chain 2. Targets are realistic 3. Farmers want to be business focussed & commercially orientated 4. Farmers want to use agribusiness 5. Sust. Farm methods; good financial manage. 6. Agribusiness create own reputational risk
Purpose	Extension officer must: 1. Mobilize large number of smallholder farmers 2. be a conduit between them and available services and 3. be regularly in the field to activate required services timely.	1. Inc. in no. of farmer groups 2. Inc. in no. of sustainable farmers 3. Farmers have more trust in extension officers	1. Survey of no. of farmer groups 2. Survey in sustainability of farmers 3. Survey of farmers about extension officers	1. Extension officers have skills to mobilize farmers & farmers want to be grouped 2. Extension officers have skills to be effective conduit 3. Extension officers motivated to be in field
Intermediate Results	Strategy 1: Improve working relationship between agribusiness and extension officers	Agribusiness more involved	Survey of agribusiness and extension officers	Both parties want to improve working relationship
	Strategy 2: Extension officers to have access to info on business viability & intelligence	Better equipped extension officers; extension officers have more knowledge	Survey of extension officers	Availability of this info
	Strategy 3: Extension officers to provide access to active and integrated support systems	Better equipped farmers; user-friendly system	Survey of farmers	Availability of this system & farmers ability to access system
	Strategy 4: Provision of mentors to extension officers	More effective extension officers; knowledge exchange	Survey of mentors &extension officers	Extension officers want to have mentors & availability of mentors
		Resources	**Cost**	
Activities	1.1 Networking events 1.2 Info days 1.3 Agric shows, e.g. NAMPO	Venue; Themed demonstrations	Government agribusiness	
	2.1 AgEcon to have info on business viability 2.2 AgEcon to provide this info to extension officers	Courses; Internet access; publications	Government	
	3.1 Creation of integrated support system 3.2 Creation of Agricultural Innovation System (AIS)	Forum; newsletters; Info network on web	Government Agribusiness	
	4.1 Identify experienced extension workers to be mentors	Mentors; Training	Government	

6.4.7 The logframe matrix

The Logframe Matrix (Table 6.2) displays the Intervention Logic (what will be done), the Objectively Verifiable Indicators (to determine if the intervention has been successful), the Sources of Verification (sources that confirm the indicators) and Assumptions (about the intervention). Lower down the matrix – at activities – are resources and costs. Resources refers to the resources needed to carry out these activities and costs refers to who will foot the bill.

6.4.8 Conclusion

In order for smallholder farmers to become more commercialized, there needs to be linkages with markets and support systems. These farmers need to be mobilized by the agricultural support system, which includes agricultural economists and agribusiness actors. In terms of the research question, the research population responded that smallholder farmers can produce sufficient business opportunities for agribusinesses and extension workers do have a facilitative role to play in linking agribusinesses to smallholder farmers.

The agricultural support system actors also identified what they believe to be the core focus of the extension service and this was viewed as the mobilization of a large number of smallholder farmers as well as to facilitate the communication and transfer of information and business requirements. They also suggested the envisaged outcomes of an effective extension service once the core focus is achieved, but to achieve the core focus several key activities will be required to satisfy.

Having said this, the first vital task of the extension service is to communicate and inform farmers as well as organise contact sessions. Secondly, the agricultural support service needs to assist with skills for technology transfer and support business planning with their holistic knowledge base of the agricultural environment at the product site. The last vital task is to monitor and supply after-care.

In a forthcoming chapter, the findings of this chapter as well as the findings of the previous chapters in this research will be merged and put forth as suggestions to a new model for the extension service in the Eastern Cape.

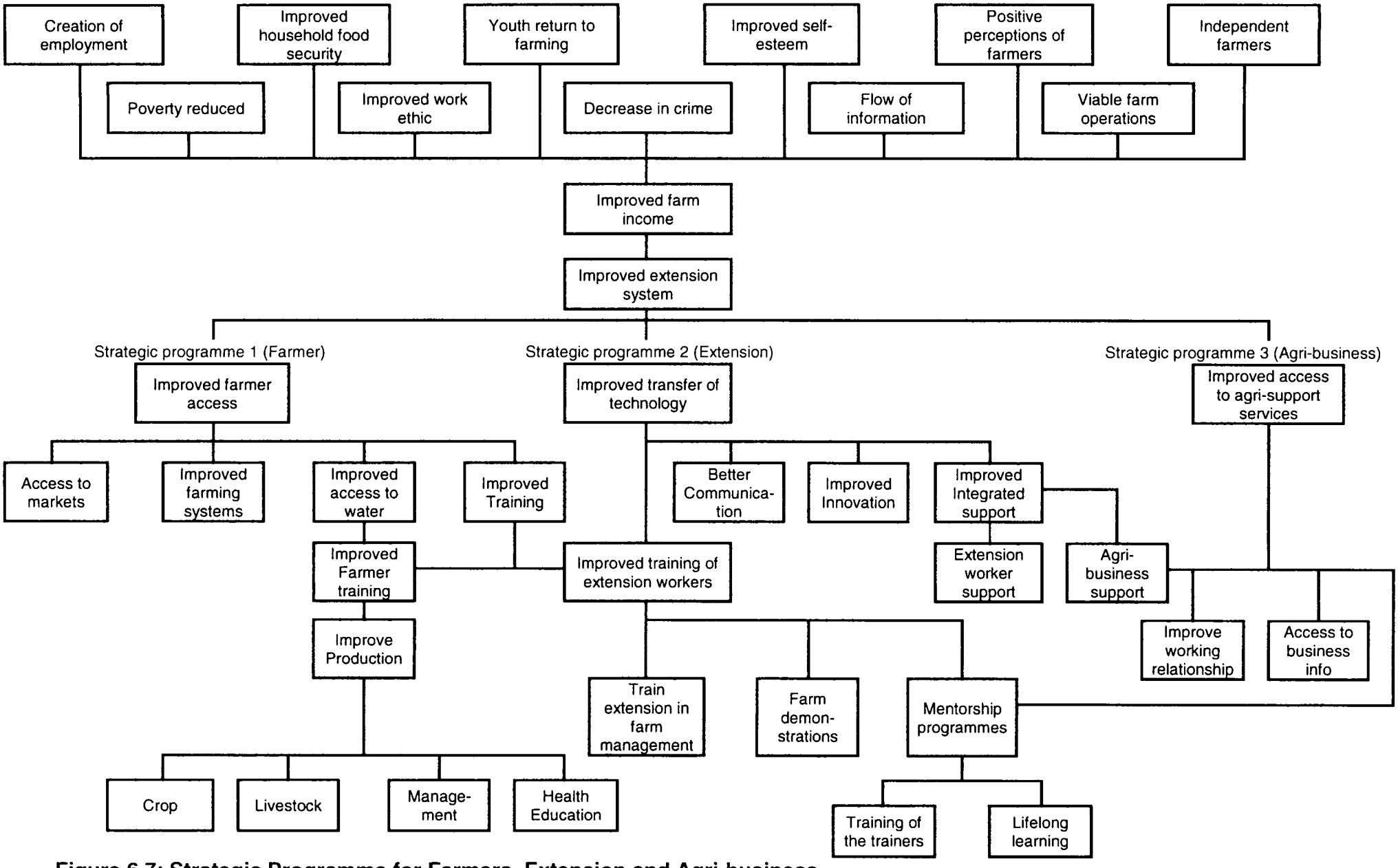

Figure 6.7: Strategic Programme for Farmers, Extension and Agri-business

6.5 STRATEGIC PROGRAMME FOR FARMERS, EXTENSION AND AGRI-BUSINESS

Fig.6.7 combine the logframes of the Small-scale farmers, Extension and Agri-business into one logframe and suggest three, strategic programmes to reach the proposed outcomes e.g.

- **Strategic programme 1 (Small-scale farmers)**

  This programme proposes that small-scale farmers must have improved access to markets, farming systems, water and training. The farmers must be trained to improve their production that they can become more sustainable.

- **Strategic programme 2 (Extension workers)**

  This programme proposes that extension workers must improve the transfer of technology to small-scale farmers through training of extension workers. Extension workers must also learn to communicate effectively to farmers that they can learn from the extension workers the new technologies. Extension workers must improve innovation to help small-scale farmers adopt new technologies. They must also improve integrated support to small-scale farmers.

- **Strategic programme 3 (Agri-business)**

  This programme proposes that small-scale farmers get improved access to agri-support services. They need access to information about busines practices and need to improve working relationships with Agri-bussines. Small-scale farmers also need integrated support from agri-bussines.

  These programmes will lead to improved extension systems that will help small- scale farmers improve their farm income.

In line with the outcomes of the strategic programmes for farmers, extension and agri-business the following proposed criteria is suggested for the implementation of the new Extension Strategy:

1. Needs of the small-scale farmers.
2. What will lead to improved farmer income.
3. The cost involved per intervention.

   {Are their already actions taking place that can link to new ones and what infrastructure is already available}.
4. What is the timeframe available
5. What National and Provincial Priorities are there e.g. Extension recovery plan.

Extension workers must be innovative to link small-scale farmers and agri-business to one another.

The extension system must create the necessary integrated support to extension workers that they can transfer technology effectively.

CHAPTER 7

CONCLUSION & RECOMMENDATIONS

Currently there is an agricultural extension model for the Eastern Cape province of South Africa, but it is not effective. A model is informed by this study that takes the research into account and aims to fulfil the need for an effective extension model.

7.1 MATRIX OF THE INFLUENCIAL FACTORS FOR SUCCESS IN EXTENSION AND THE ACTORS IN THE EXTENSION ENVIRONMENT

According to Swanson *et al.* (2010), it is important for the extension organization to determine which actors are involved in the extension environment and the role they play within the environment. Furthermore, these actors can play a role in strengthening the extension organization if they are incorporated into the extension system. Table 7.1 is proposed as a matrix of the influential factors for success in extension and the actors in the extension environment as discussed in Chapter 5. The matrix displays the strength (Table 5.1) of linkages between the influential factors for success and the actors in the extension environment. This matrix are presented in Table 7.1.

Table 7.1: **Matrix of the influential factors for success in extension and the actors in the extension environment**

INFLUENTIAL FACTORS FOR SUCCESS	ACTORS IN EXTENSION ENVIRONMENT						
	Role players	Educational institutions	Department of Extension	Subject-matter Specialists	Extension Managers	Village-Level Extension Worker	Umbrella of Emerging-Farmer Organizations
Personal characteristics of extension worker		xx	xx	xx	xx	xxx	xxx
Training of Extension Worker	x	xxx	xx	xx	xx	xxx	x
Leadership and mentoring ability		xx		xx	xx	xxx	xxx
Support (Technical & Skills)	xx	xxx	xx	xxx	xxx	xxx	xx
Financial Factors	xxx	x	xxx	xx	xxx	xxx	xx
Community Co-operation & Networks		xx		xx	x	xxx	xxx
Communication	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Staffing Related		x	xxx	xxx	xxx	xxx	xxx

x = Weak linkage; xx = Necessary linkage; xxx = Strong and important linkage

7.1.1 Actors in the extension environment

The actors in the extension environment are the role players, educational institutions, extension department, subject-matter specialist, extension managers, village-level extension workers and umbrella of farmer organization for small-scale farmers. The role players consist of the government and its various agriculture and rural development ministries, the top commercial farmers, co-operatives, the private sector (including banks and other financial institutions) and research. The role players exert pressure on the educational institutions and on the department of extension.

The educational institutions consist of universities and agricultural colleges that are involved in agricultural extension, whether it is in terms of formal agricultural

qualifications or in additional training once extension workers are within the extension-working environment. They are involved in research, this research is requested by extension workers and concerns interactions with farmers and the problems extension workers and farmers face. This is researched and returned to extension workers so that they can deliver the knowledge, skills or products to farmers.

The Department of Extension is in charge of agricultural extension and operates under the Department of Agriculture, Forestries and Fisheries (DAFF) and Eastern Cape Department of Agriculture (ECDoA). They principally deal with agricultural policy and rural development. They consist of top management officials and are in charge of all extension operations, they delegate down to extension managers. Extension managers are middle management and manage the village-level extension workers. They take research needs from the extension workers and transfer it up to the Department of Extension and educational institutions.

Once research is conducted, either by academic institutions or by subject-matter specialists, it is taken by the subject-matter specialists and transferred down to the extension workers and farmers. As the name suggests, subject-matter specialists have specialized in a specific subject. This specific subject would be in either crop production, livestock production, marketing or financing.

The village-level extension worker is the link between the farmers and the research environment. They connect with rural communities and identify their needs. These needs are conveyed by the extension worker up to, eventually, the educational institutions where the needs are researched and solutions found. These solutions are sent down the channels to the extension worker who transfers the technology or innovation back to the farmer and monitors the results. The results are then conveyed back to the researchers.

The farmers are new or small-scale farmers and will in time, with help from the department of extension, become established commercial farmers. They are in direct contact with the village-level extension worker and to a lesser extent, the subject-matter specialist. They should belong to a localized (at village level) farmer organization.

7.2 INFLUENTIAL FACTORS FOR SUCCESS IN AGRICULTURAL EXTENSION

There are certain factors that have an influence on the success of agricultural extension operations. These factors interact with the various actors in the extension environment to varying degrees. Below is an explanation of how the matrix works and the degree to which the actors in the extension environment interact with the influential factors for success.

7.2.1 Personal characteristics of the extension officer

The personal characteristics of the extension worker are an important factor to the effectiveness of extension operations. It entails various characteristics that affect effectiveness. This includes availability, timeliness, honesty, enthusiasm, ability to listen and preparedness to dirty one's hands. This foremost affects the village-level extension worker and the small-scale farmers under the umbrella of farmer organizations or groups. This is of primary importance as the manner in which the extension worker interacts with farmers will exert influence on the effectiveness of extension efforts.

There are also necessary linkages between this factor, subject-matter specialists, educational institutions, Department of Extension and extension managers. The linkage to educational institutions is in regard to the study and research into this factor and thereafter educating the extension worker about extension-effective personal characteristics. The link to the extension manager is related to their supervisory role over extension workers and contact with farmers and farmer groups will still continue even though they are not the first line of contact with farmers. The same is true for subject-matter specialists who will still have contact with farmers and will therefore still need to exhibit extension-effective personal characteristics. The link with the Department of Extension is that they should identify these characteristics before hiring job candidates. This will help ensure that they select the right kind of person for the job at hand.

7.2.2 Training of extension workers

The training of extension workers starts with a formal agricultural qualification and thereafter further training in areas that have been identified as lacking the adequate requirement. It also requires the flow of research from educational institutions to extension workers. The strongest and the most important linkage here is the link between the educational institutions, such as universities and agricultural colleges, and the village-level extension workers. This is important because these extension workers are at the front of extension operations and have direct influence over farmers' actions. Training is very important for them as it gives them an opportunity to improve their skills and knowledge base. These skills and knowledge would be acquired from educational institutions and should be based upon information needs of the farmers and skills that have been found to be lacking within the working abilities of extension workers.

Extension managers and subject-matter specialists also require further training in order to improve their knowledge and skills base so that their efficiency is improved. Extension managers could get further training in the managing of operations and subject-matter specialists can receive further training, based on new research, within their specialization. This would also be conducted through academic institutions. The Department of Extension has a necessary linkage as it must ensure that extension workers receive training. This should form part of their mandate. The industry role players would not have a direct influence over the training of extension workers, but would rather have an influence over research conducted by themselves or by educational institutions. In this way, there is a trickle-down effect of their knowledge and skills to the extension workers and ultimately to the farmer.

7.2.3 Leadership and mentoring ability

The link here should be strongest between the extension workers and the farmers. This link is based upon the leadership and mentoring ability of the extension worker as this determines the effectiveness of the worker's efforts in motivating the farmers towards

adopting improved technologies. If the farmers cannot relate to the extension worker, then effective communication, motivation and technology adoption efforts will be in vain.

In terms of relationships, leadership and mentoring ability, the extension managers should 'lead by example' and in this way informal training of village-level extension workers will commence. Subject-matter specialists will also come into contact with farmers and they will need to be aware of and make use of factors that play a crucial role in influencing farmers. Educational institutions are also a necessary linkage as they conduct research into the various interactions that occur throughout the extension organization. From this research, behaviour that is effective and ineffective can be established and thereafter the various extension actors can be trained according to the needs required of their respective extension level.

7.2.4 Support (technical and skills)

Support refers to technical knowledge and skills that extension workers may need from other actors in the extension environment. It would include technical and logistical support, and relevant technologies. This factor is influenced by all the actors in the extension environment. The farmers are influential with regard to their needs being met through the efforts of extension workers and the support they receive. Support of technical information and skills is primarily for the village-level extension worker for the improvement of their skills and knowledge base. Support is also for the subject-matter specialists and the extension managers, although these actors have a dual role as they also provide support to the village-level extension worker.

Support is primarily provided for by the educational institutions, which collect data on the types of support needed by the different levels of extension players and thereafter give the support that is needed. Support is also provided for by the Department of Extension, whose duty it is to ensure that the different extension actors receive the adequate support so that the organization runs smoothly and efficiently. Support is supplemented by the various role players who have conducted their own research in terms of needs and business opportunities. Support from the various role players comes

into the extension system through educational institutions who value the research conducted by the various role players.

7.2.5 Financial factors

Financial factors include working capital, incentives and remunerations, and an understanding that farming is a business. Educational institutions have the weakest linkages here and their link is in terms of research into the effects of the financial factors on effective extension. Farmers have a necessary linkage as they themselves need to understand that farming is a business opportunity. Similarly, subject-matter specialists – especially the financial and marketing specialists – form a necessary linkage as these specialists will supply information to farmers regarding business opportunities. Besides this fact, inadequate incentives or remuneration and working capital will have an adverse effect.

The Department of Extension has a strong and important linkage with this factor as they are the suppliers of working capital, remunerations and incentives. They must ensure that remunerations and incentives, and that working capital is adequate and does not adversely affect the functioning of the extension organization. Role players have an important linkage too as certain role players can become involved in funding extension operations and research. Beyond this, the role players have a firm understanding and experience in the financial side of business ventures. The village-level extension worker has a strong and important linkage to financial factors as their work is favourably or adversely affected by the situation surrounding incentives or remuneration and working capital. The extension worker also needs a firm understanding of farming as a business as they need to convey this thought to the farmers. Extension managers also have an important linkage as they control certain financial factors such as incentives or remuneration and working capital. It is their responsibility to ensure that these factors are not constraints on effective extension.

7.2.6 Community co-operation and networks

This factor relates chiefly to the farmers' community structures and the extension workers' interaction with these structures. The farmers and village-level extension workers have the most important and strongest linkage to this factor as it relates to structures and networks within the community. The extension worker needs to identify such things and give recognition to these structures. The same applies to the subject-matter specialists who will also operate within these community structures and they need to recognize this phenomenon. There is also a necessary linkage with educational institutions in terms of research into these structures and how they operate. This research would go into training and support of extension workers. The extension managers have a weak linkage to this influential factor. Their link is to be aware of these structures as the extension workers under their management operate within these structures.

7.2.7 Communication

Good communication facilitates success. Effective communication is of utmost importance to all of the actors in the extension environment. Communication is an important and strong linkage for all of the actors in the extension environment. It should be noted that not all of the actors communicate with each other. For example, the role players mostly communicate with the educational institutions and the Department of Extension while the farmers mostly communicate with the village-level extension workers and the subject-matter specialists. With regards to the farmers and communication, language differences between the farmers and extension workers can be a major constraint to communication. This means that the extension workers need to be fluent in the language of the farmers.

The village-level extension workers, extension managers, extension department, subject-matter specialists and educational institutions should all communicate with one another and information should flow back and forth between these actors. Farmers' needs should flow up to the universities, who formulate new technologies and then send

them down to the extension worker. The results are then sent back up through extension management and subject-matter specialists to the educational institutions. Communication, although not always recognized as very important, is paramount to the success of any extension operation. Without communication, the training of extension workers would be impossible, farmers would not have a relationship with extension workers and there would be no community co-operation, and if there was support through technical knowledge and skills, it would never reach the extension worker. Communication should not be ignored.

7.2.8 Staffing

Staffing refers to the number of extension staff and their workload. A shortage of staff would result in the overloading of work on the extension staff. Staffing is an important linkage for the four extension actors as the number of staff will determine their workload and hence how well they perform their work. If extension staffs are overloaded, they will not be able to reach farmers and influence them effectively. This is ultimately the responsibility of the Department of Extension who needs to know how many of the different extension actors are needed for the organization to be effective and then implement staff accordingly. Further research is required into how many farmers the extension workers can reach and the extent of their influence on farmer efficiency. The educational institutions has a weak link as although it is unaffected by extension staff, understaffing and overloading the workload of this organization will result in ineffective transfer of knowledge to and from educational institutions and extension staff.

7.3 THE COMMUNICATION-PARTICIPATION AND INNOVATION (CPI) EXTENSION MODEL

The communication-participation and innovation extension model (Figure 7.2) is designed with the (a) matrix of the influential factors for success in extension and the actors in the extension environment and (b) the implementation of a forum and innovation activities in mind i.e. the C.P.I. model for extension. The model is divided into

steps that focus on the relationships between the various actors. The communication-participation in innovation extension model follows a bottom-up approach as this has been found to be sustainable and encourage ownership of extension initiatives. The steps are as follows:

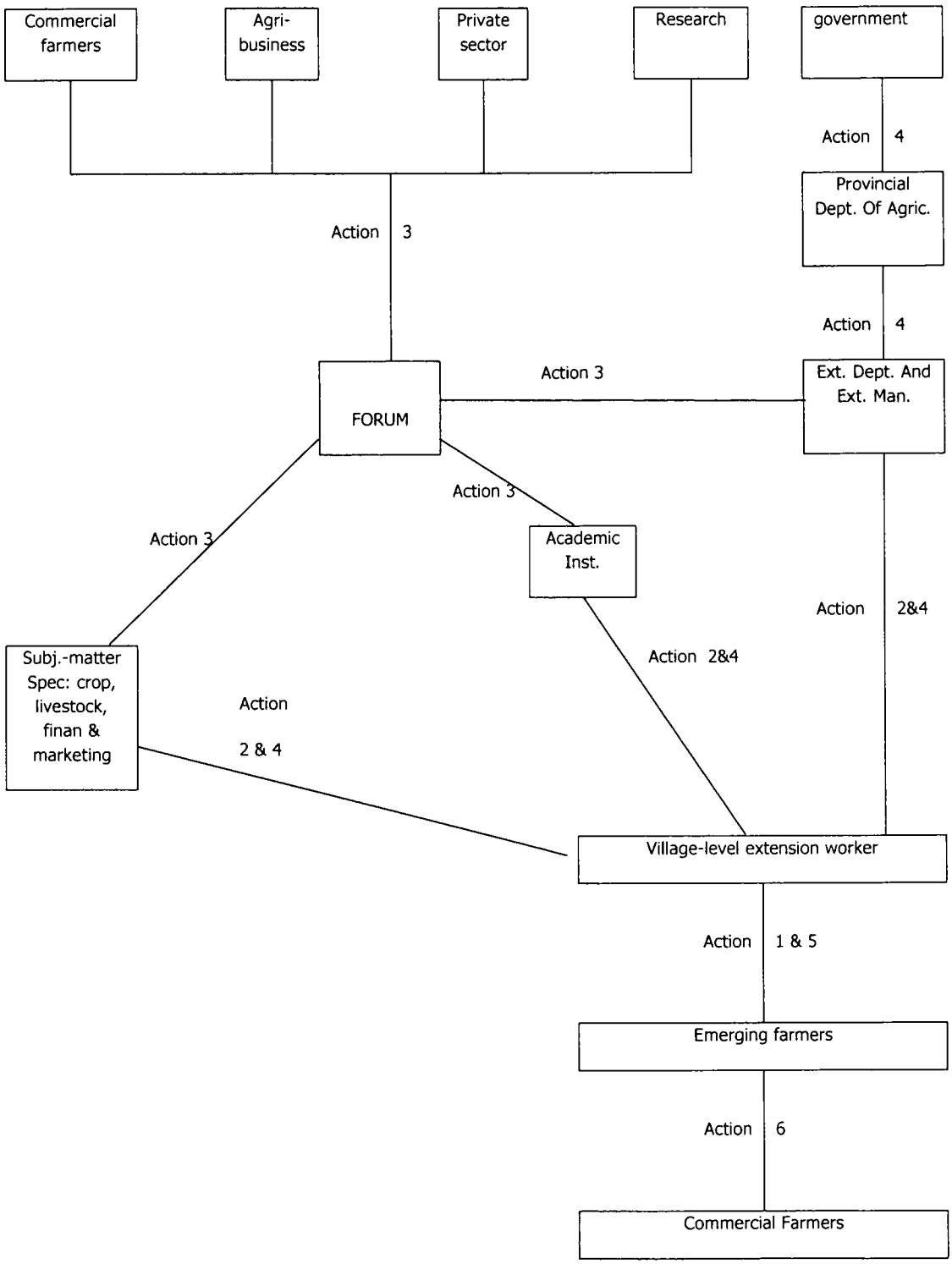

Figure 7.2: Communication-Participation in Innovation Extension Model

Action 1 is the relationship between the small-scale farmers' organization and the village-level extension worker. At this step in the model, the small-scale farmers' needs are established through participatory rural appraisals.

Action 2 entails the relationship between the village-level extension worker and the subject-matter specialists, educational institutions and extension manager. This relationship revolves around the extension worker transferring the farmers' needs to these three actors.

Action3 revolves around the forum where the various role players meet with the Department of Extension and extension managers, educational institutions and the subject-matter specialists. The forum would entail the discussion of the farmers' needs as well as any other important agenda that would affect the farmers. Thereafter the actors involved return to their respective institutions with the conclusions drawn from the forum.

Action 4 involves the actors at the forum distributing the conclusions drawn from the discussions to the village-level extension worker. The information that is transferred to the extension worker is a response to the farmers' needs that were identified in Step 1. Included in Step 4 is the Department of Extension communicating with the Provincial Department of Agriculture, who thereafter relays the message to the government departments, about what is happening in the extension environment.

Action 5 entails the village-level extension worker delivering the message to the small-scale farmers. This would hopefully satisfy their needs.

Action 6 is the ultimate goal and is when the farmers can help themselves and their status changes from small-scale farmers to commercial farmers.

In this way, communication has a cyclical role throughout the model. It is imperative that the cycle starts with the small-scale farmers to ensure a bottom-up approach is followed. It should be noted that, for example, Step 3 might not occur if the actors in Step 2 have the knowledge to satisfy the identified needs. This would also be the case if the village-level extension worker knew how to satisfy identified needs at Step 1. The forum would, however, still continue so that all the actors in the extension environment

would be aware of events in the said environment. After Step 5 has been implemented, the model starts again at Step 1 whereby the extension worker evaluates the effectiveness of the transferred technology. Step 2 would then follow with the extension worker informing the other actors in Step 2 about the effectiveness of the said technology and any other identified needs. In this way, the cycle continues.

7.4 IN CONCLUSION

This model also incorporates other stakeholders in the agricultural environment, such as agribusinesses, NGO's and top-commercial farmers as these stakeholders have influence over agricultural activities; this was a lesson learnt from the ATMA extension system in India (Swanson *et al.*, 2010).

According to Rivera*et al.*(2001), extension services have a long history in group promotion and organization. It has been argued that extension can be more effective when extension workers deal with farmer organizations instead of individual farmers. It has been found that farmer organizations promote independence, democracy and development.

The FAO promotes stakeholder participation in the decision-making process of extension program planning, with the ultimate view of stakeholders taking full responsibility of program planning. This participatory approach can be seen in various extension approaches such as Farmer Field School Approach, Farmers' Forest Management Schools and Farming Systems Development (Rivera *et al.*, 2001).

According to Swanson (2008), a new approach in extension is to identify potential enterprises according to the agro-ecological conditions and market access. This is followed by farmers being organised into groups that specialise in a specific enterprise. It then becomes easier for extension workers to deliver skills and information on a specific enterprise to the participating group members. Once these group members are successful at their specific enterprise, they can then begin to help other farmers to organize themselves – as in farmer-to-farmer extension.

The FAO's goals of food security and poverty alleviation align themselves to promoting farmer groups, participating with stakeholders, extension and programs to train farmers (Rivera*et al.*, 2001).

Christoplos (2010) suggests the establishment of forums, whereby all actors in the extension environment can meet to discuss pressing issues concerning extension. These forums should include agribusinesses, as agribusinesses across Africa are helping millions of small farmers through access to improved seeds, fertilizers and information about their use (Annan, 2010).

Having said this, one can conclude that the hypothesis is true as the existing extension model in the Eastern Cape's Department of Agriculture is outdated. The proposed model, The CPI Model, has identified and incorporated new trends in extension from around the world. This model should be tested through pilot studies to determine its effectiveness in the extension environment. This will require further research.

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ANNEXURE 1

ABSTRACT

Agriculture and rural development in the Eastern Cape, and in South Africa, are in vital need of revitalization; especially since the people of the communal areas of the Province are often referred to as the poorest of the poor. Organizations, with specific reference to the Eastern Cape's Department of Agriculture and Rural Development, use agricultural extension as a vehicle for developing agriculture and the rural areas. Presently, the Department uses the Farming Systems Research and Extension (FSR/E) model for this purpose.

The objectives for this thesis are to determine:

- if this extension model presently used is effective, as well as to determine how to strengthen this model;
- the perceptions of extension workers and agricultural researchers on factors supporting effective agricultural extension;
- the specific needs of small-scale farmers and how they foresee themselves to become more commercially orientated;
- the thoughts of practicing extension workers on the public extension services' strengths, weaknesses, opportunities and threats, and what they believe needs to be done to make the extension service more efficient and effective;
- the thoughts of actors from the agricultural support services – namely actors from agribusinesses and agricultural economists – on what role they see the public extension service should play and the steps that the extension service should take in order to be more effective; and
- a new extension model for the Eastern Cape will be determined.

This was achieved by consulting relevant literature sources, including the experts in the field on the present developments in extension, as well as using a questionnaire to determine the perceptions of the extension workers and agricultural researchers, a Logical Framework Analysis was used to determine the perceptions the small-scale farmers faced as well as the ways that they believed would solve their problems. Another two Logical Framework Analysis wereused to determine the thoughts of practicing extension workers and actors from the agricultural support services on what they believed is needed to strengthen the extension organization.

The results from the study revealed information on global extension developments: perceptions of extension workers and researchers; the actual needs of a rural community and their vision of how to become more commercially orientated; the strengths, weaknesses, opportunities and threats of the public extension service as viewed by the province's extension workers; the views of the extension workers concerning the problems that they face and ways to solve these problems; the views of the actors from agribusinesses and agricultural economists – collectively known as the agricultural support services – on the problems they have with the public extension service, the envisaged role that they see for the extension service and their envisaged way forward for the extension service in the province; a matrix of the factors linked to effective extension and the actors involved in strengthening these factors; and proposed a new and strengthened extension model.

This new model is a decentralized, market-orientated extension model, which incorporate all actors within the agricultural environment and the actual needs of farmers. Involvement of various actors in strengthening the public extension service and the extension workers' skills was also described and is included in the model.

Keywords:

Extension Model

Extension Worker

Small-Scale Farmer

Agricultural Support Systems

Researchers

Logframe Analysis

Rural Development

Food Security

Eastern Cape Province

Communication Participation Innovation(CPI)

Extension Model

ANNEXURE 2

UITTREKSEL

Landbou en landelike ontwikkeling in die Oos-Kaap en in Suid-Afrika, moet herbeplan word; veral omdat daar na die landelike gebiede van die ou Ciskei en Transkei verwys word as die armste van arm gebiede. Organisasies met spesifieke verwysing na die Oos-Kaapse Departemente van Landbou en Landelike Ontwikkeling, gebruik landbou as voertuig vir ontwikkeling in landelike gebiede. Huidiglik gebruik die Departement die Plaas Sisteem Navorsing en Voorligting model vir hierdie doel.

Die objekte van hierdie tesis is om te bepaal:

- of hierdie voorligtingsmodel wat huidiglik gebruik word, effektief is en om te bepaal hoe om die model te versterk;
- die persepsies van die voorligters en landbou-navorsers op faktore wat effektiewe landbouvoorligting ondersteun;
- die spesifieke belange van kleinboere en hoe hulle meer gekommersialiseerd kan raak;
- die gedagtes van huidige landbou-voorligters op die publieke landbou-voorligtingstelsel se sterk en swak punte asook geleenthede en bedreigings en wat landbouvoorligters glo moet gebeur om die voorligtingstelsel meer effektief te maak;
- die gedagtes van rolspelers in die landbou ondersteuningsdiens – naamlik landboubesighede en landbou-ekeonomie – op watter rol hulle sien publieke landbou-voorligtingsdiens moet speel en die stappe wat die landbouvoorligtingsdiens moet neem om meer effektief te wees; en
- of daar 'n nuwe landbouvoorligtingsmodel vir die Oos-Kaap ontwikkel moet word.

Gepaste literatuur was deurentyd geraadpleeg, insluitend kenners van huidige ontwikkelings in landbouvoorligting. 'n Kwantitatiewe vraelys is gebruik om die persepsies van landbouvoorligters en landbounavorsers te bepaal. 'n Logiese Raamwerk Analise was gebruik om die probleem wat kleinboere ondervind te bepaal en ook maniere te kry om hierdie probleem op te los. Nog twee Logiese Raamwerk Analises was gebruik om die gedagtes van landbouvoorligters en landbou-ondersteuningsdienste te verkry oor wat hulle glo nodig is om landbouvoorligting te versterk.

Die studie het inligting verskaf oor internasionale voorligting ontwikkelings; persepsies van landbouvoorligters en navorsers; die werklike behoeftes van die landelike gemeenskap en hulledroom om meer kommersieël georiënteerd te raak; die sterk punte, swak punte, geleenthede en bedreigings soos gesien deur die landbouvoorligters in die Oos-Kaap; die menings van landbouvoorligters rakende probleme wat hulle ondervind en maniere om die probleme op te los; die menings van rolspelers in landboubesighede en landbou-ekonomie – bekend as landbouondersteuningsdienste – rakende probleme wat hulle ondervind met publieke landbouvoorligting en die rol wat hulle vir landbouvoorligting sien en die pad vorentoe vir landbouvoorligting in die Provinsie; 'n matrix van faktore wat verband hou met effektiewe voorligting en die rolspelers betrokke in die versterking van die faktore; en 'n nuwe verbeterde voorligtingsmodel.

Die studie het relevante resultate gelewer. Dit het tot die gevolgtrekking gekom dat 'n gedesentraliseerde, mark georiënteerde voorligtingsorganisasie, wat insluit alle rolspelers in die landbouomgewing en die werklike behoeftes van die boere, is meer effektief as huidige voorligtingsmodelle. Betrokkenheid van verskeie rolspelers in die versterking van die publieke voorligtingstelsel en die voorligtingswerkers se kennis was ook beskryf en is ingesluit in die model.

ANNEXURE 3

QUESTIONNAIRE

FACTORS IMPACTING ON THE SUCCESS OF EXTENSION WORKERS

The Centre for Sustainable Agriculture and Rural Development is currently conducting research into the factors that impact the success of extension workers. Please take the time to share your views on this topic by completing the following questionnaire.

All your responses will be treated confidentially.

ACADEMIC RESPONSE / EXTENSION AGENTS RESPONSE

SECTION A: BIOGRAPHICAL INFORMATION

For office use only

1-3

How old are you?

_____

4-5

Are you currently employed? (Please mark your response by circling the most appropriate number).

)	Yes	1
)	No	2

6

For office use only

If yes, how long have you been working at your current place of employment?

_____ 7-8

For how many years have you been formally employed on a full-time basis in the agricultural sector?

_____ 9-10

Please indicate your gender.

)	Male	1
)	Female	2

11

Please indicate the highest level of formal education you have already obtained.

) None		1
) NQF 2-4	Certificate	2
NQF 5	Senior Certificate National Diploma	3
NQF 6-8	Advanced Diploma Higher Diploma Degree	4
NQF 9	Masters Degree	5
NQF 10	Ph D Degree	6

12

Are you currently studying for a higher NQF qualification?

Yes	1
No	2

13

For office use only

7. Do you have any experience working as an extension worker?

a)	Yes	1	
b)	No	2	14

If you answered yes, please indicate approximately how many years' experience.

a)	Less than 1 year	1	
b)	1 – 2 years	2	
c)	3 – 4 years	3	
d)	5 or more years	4	15

SECTION B

FACTORS THAT ENHANCE THE EFFECTIVENESS OF SUSTAINABLE AGRICULTURAL EXTENSION SERVICES

There are various factors that enhance the effectiveness of agricultural extension workers and thereby lead to the sustainability of these services. We would like to find out how important you believe each of the following factors to be in contributing to the effectiveness of the extension workers. Carefully read through each statement and then indicate your response on the rating scale provided by circling the most appropriate response.

For example: If you read the statement and do not think that the factor is important to the effectiveness of agricultural extension workers at all you will circle a 1, whereas if you think it is very important then you would circle a 5.

a. **It is important for the extension agent to have a formal agricultural qualification.**

Not important Very important

1	2	3	4	⑤

For office use only

FACTORS THAT FACILITATE SUCCESS

. **Technical support (in the form of technical knowledge and skills) from the extension workers to farmers is an important extension principle that underlies an effective extension approach.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		16

. **Good communication between the extension worker and the farmer is the vehicle through which effective extension takes place.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		17

. **Is it important for the extension agent to be trained in the principles of effective extension work?**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		18

. **Is it important for the extension agent to have a formal agricultural qualification?**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		19

For office use only

5. **What is the minimum level of education an extension agent should have in order to be effective?**

1	2	3	4	5	6	7		
None	NQF 5	6	7	8	9	20		
No quail-fication	Senior Certificate	Diploma	B-degree	Honours degree	Masters degree	Ph D		20

. **Is human capital development of extension agents important to achieve sustainable development on emerging farmers' farms?**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		21

. **In the view of the low technical competence and qualification of the majority of extension staff is a strong knowledge support system important.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		22

. **There should be a greater emphasis on recruiting extension workers with professional qualifications.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		23

The quality of service the extension agent delivers is more important than the level of qualification they have.

Strongly disagree Neutral Strongly agree

1	2	3	4	5		24

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10. **Negotiation with tertiary institutions regarding the development of formal education programs and qualifications specifically for extension workers is imperative.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		25

11. **The extension agent must have a clear vision for the farmers they work with that is future focused.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		26

12. **Is it important for the extension agent to recognize the uniqueness of the individual farmer in the community and adapt their extension strategy accordingly.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		27

13. **An extension agent must realize that all people have the same potential to improve their own interest, to speak for themselves and to help as well as be helped.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		28

14. **It is the extension agent's responsibility to help and support the farmers to conceptualize and prioritize their problems and needs.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		29

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15. **The extension agent needs to lead and guide the farmers towards sustainable farming practices, slowly and at a pace determined by the farmers.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		30

16. **The extension agent must identify and give recognition to the local structures for participation and forming of linkages.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		31

17. **The extension agent must understand farming as a business requiring a weighing of cost and returns.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		32

18. **The character and work ethic of the extension worker will directly impact on their effectiveness with the farmers. For each of the following characteristics please indicate how important you think the characteristic is to their effectiveness.**

18.1 **Be available when the farmers need support and advice.**

Not important Unsure Very important

1	2	3	4	5		33

18.2 **Listen carefully to what farmers say.**

Not important Unsure Very important

1	2	3	4	5		34

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18.3 **Be prepared to dirty their hands in the soil with the farmers.**

Not important Unsure Very important

1	2	3	4	5		35

18.4 **Be on time, rather early but never late.**

Not important Unsure Very important

1	2	3	4	5		36

18.5 **Be honest with the farmers at all times.**

Not important Unsure Very important

1	2	3	4	5		37

18.6 **Become a technical expert in at least one agriculture related field.**

Not important Unsure Very important

1	2	3	4	5		38

18.7 **Give recognition to the plans and knowledge of the emerging farmers.**

Not important Unsure Very important

1	2	3	4	5		39

18.8 **Understanding behaviour change with farmers (try to understand why).**

Not important Unsure Very important

1	2	3	4	5		40

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19. Farmers and extension workers do not function in isolation, but rather within the context of a specific community. Please indicate the impact of the following community related factors to the success of extension workers.

19.1 In order for extension workers to be optimally effective it is necessary for them to earn the respect of the communities they are working in.

Not important		Unsure		Very important		
1	2	3	4	5		41

19.2 Encourage self-help.

Not important		Unsure		Very important		
1	2	3	4	5		42

20. How important are each of the following personal qualities of extension workers in their profession?

20.1 Ability to get on with people. Extension workers work with people and must therefore be able to establish good working relationships with others. They should demonstrate characteristics such as patience, understanding and humility.

Not important		Unsure		Very important		
1	2	3	4	5		43

20.2 Enthusiasm for the job. Only the people who have a positive attitude and strong commitment for extension careers should be encouraged to pursue this career.

Not important		Unsure		Very important		
1	2	3	4	5		44

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20.3 **Common sense and initiative. A reasonable measure of common sense and initiative required from extension workers in order for them to assist farmers with the practical tasks required for effective farming.**

Not important Unsure Very important

1	2	3	4	5		45

21. **It is essential for extension agents to have the will to succeed in their work as they are mostly expected to work unsupervised.**

Strongly disagree Neutral Strongly agree

1	2	3	4	5		46

22. **The manner in which the extensionist approaches his/her work is also the manner most likely to be adopted by those who work under, alongside and above him and thus the work ethic of the extension worker makes an important contribution to the success of the farmers.**

Not important Unsure Very important

1	2	3	4	5		47

SECTION C

CONSTRAINTS LIMITING THE EFFECTIVENESS OF AGRICULTURAL EXTENSION WORKERS

There are various factors/constraints that inhibit the effectiveness of agricultural extension workers. We would like to find out to which extent you believe each of the following negatively affects the effectiveness of the extension workers. Carefully read through each statement and then indicate your response on the rating scale provided by circling the most appropriate response.

For example: If you read the statement and do not think that it is a constraint at all you will circle a 1, whereas if you think that it is a factor that has a significant negative impact on the effectiveness of the extension workers you would circle a 5.

Inadequate formal researcher-extension linkages

Not a constraint A big constraint

1	2	3	4	⑤

Now for each of the statements below, indicate to what extent you believe it is a constraining factor in the effectiveness of extension workers.

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1. **Inadequate flow of research between researchers and the extension agents.**

Not a constraint A big constraint

1	2	3	4	5		48

2. **Limited availability of logistical support for extension personnel.**

Not a constraint A big constraint

1	2	3	4	5		49

3. **Insufficiency of relevant technologies available to extension workers.**

Not a constraint A big constraint

1	2	3	4	5		50

4. **Inadequate incentives and/or low remuneration for extension personnel.**

Not a constraint A big constraint

1	2	3	4	5		51

5. **Farmer's lack/shortage of working capital.**

Not a constraint A big constraint

1	2	3	4	5		52

6. **Inflexible extension approach by extension heads.**

Not a constraint A big constraint

1	2	3	4	5		53

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7. **Extension personnel are overloaded.**

Not a constraint A big constraint

1	2	3	4	5		54

8. **Little or no in-service training.**

Not a constraint A big constraint

1	2	3	4	5		55

9. **Neglect of the farmer's traditional and experience-based knowledge system.**

Not a constraint A big constraint

1	2	3	4	5		56

10. **Frequent changes in extension strategy at a national policy level by the Department of Land Affairs and Agriculture.**

Not a constraint A big constraint

1	2	3	4	5		57

11. **Shortage of extension staff.**

Not a constraint A big constraint

1	2	3	4	5		58

12. **Extension agents don't speak the language of the people in the area.**

Not a constraint A big constraint

1	2	3	4	5		59

ANNEXURE 4

OVERVIEW TO THE STRATEGIC PLAN OF THE DEPARTMENT OF AGRICULTURE IN THE EASTERN CAPE

It is recognized that Agriculture is the backbone of the Eastern Cape economy according to the Strategic Plan (2009). The Department of Agriculture has recognized four primary pillars supporting their agricultural strategies which are:

- The Political Pillar
- The Managerial Pillar
- The Operational Pillar
- Environmental Pillar

The Managerial Pillar is under-pinned by the analysis of the elements of the Political Pillar that enables and defines the strategic functions for the Department. The planning process determined the following strategic functions:

- infrastructure;
- human capacitation;
- entrepreneurial development;
- technology development and research;
- animal and plant production improvement;
- support services;
- strategic development and management.

This process of analyzing the elements of the political pillar and the definition of strategic functions was led by the head of Department, with the Executing Authority providing oversight to ensure that the strategic functions are aligned to the elements of

the political pillar. When the strategic functions were defined, the process has progressed to the phase of analyzing each function with the intention to define tasks to be performed in their execution. This was followed by a process, where Managers and Assistant Managers were included. This session was led by General (Programme) Managers together with the Head of Department providing oversight to ensure that tasks were aligned to the strategic functions.

This process confirms the alignment of the Department of Agriculture with the strategic plan of the Eastern Cape Provincial Government, the Provincial Growth and Development Plan (PGDP). The Department of Agriculture cuts through all six of the strategic objectives. They are:

- Systematic poverty eradication through a holistic, integrated and multi-dimensional approach to pro-poor programming.
- Agrarian transformation and strengthening of food security.
- Consolidation, development and diversification of the manufacturing base and tourism potential.
- Human Resource Development.
- Infrastructure Development.
- Public Sector and Institutional Transformation.

The department has strategic programmes as shown in its strategic plan which are designed specifically to effect these objectives.

- **Vision**

A united and prosperous agricultural sector.

- **Strategy**

  * **Green revolution**

    A sustained social and institutional mobilization and organization accelerated, sustainable agricultural growth and development in the Province of the Eastern Cape.

  * **Goal of the strategy**

    The overarching goal of the Green Revolution strategy is Rural Development and Agrarian Transformation. We have begun a revolution. The successes achieved have encouraged us to embark on a full scale war, a war against under development and its related poverty, through promoting agriculture as a social and economic process.

- **Mission**

  Facilitating, promote and coordinate sustainable food production and agricultural development towards eradication of underdevelopment, poverty and unemployment through equitable access to resources and meaningful participation by all stakeholders.

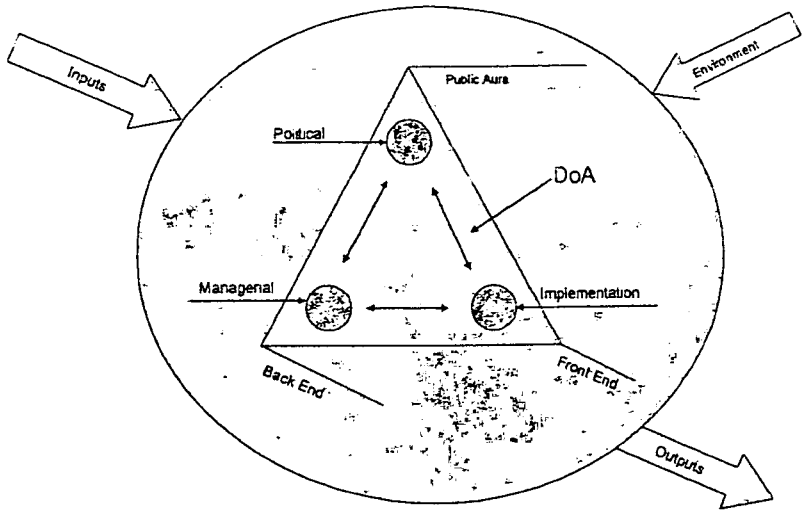

Figure 3.6: The Service Delivery Triad Model

Political Pillar

The current political mandate of the government is two-fold: "A People's Contract to Create Work and Fight Poverty" (2004-09) – and "A Plan To Make Local Government Work Better For You" (2006-11). From this electoral mandate, an overarching strategy and policy framework. The Green Revolution, were generated by the Department led by the Executing Authority. Everything that follows must be in alignment with the objectives of this pillar, otherwise the political mandate of the governing party will be misconceived (Strategic Plan, 2009).

The Six Peg Policy Framework

- Fencing
- Dipping Tanks
- Tractors
- Livestock dams
- Irrigation scheme revitalization

- Human Resource development

Where and what is the greatest need. Intervention based on the largest number of beneficiaries (pro poor) and targeting vulnerable groups, youth, women, etc. Implementation of projects meant to contribute to the growth strategy of the Eastern Cape Province. Special focus on contributing to the successful implementation of High Impact Priority Projects (HIPP's). Sustainable projects shall be implemented with the understanding that they are viable, and directly contributing to the PGDP objectives.

The overall context for the implementation of the six-peg policy comprises:

(a) the millennium development goals (eradication of extreme poverty and hunger, promote gender equality and empower women, reduce child mortality, combat HIV and AIDS, ensure environmental sustainability and develop a global partnership for development);

(b) the NEPAD objectives (the African Peer Review Mechanism, economic competitiveness, good corporate governance, market access, agricultural development, human development, science and technology, environment an tourism and infrastructure development) as well as its agriculture specific Comprehensive Africa Agricultural Development Programme (land management programme, water management and irrigation initiatives, agri-business, supply chain and control initiatives and African nutrition initiatives);

(c) the Freedom Charter (The People Shall Share In The Country's Wealth!, The Land Shall Be Shared Among Those Who Work It!, There Shall Be Work And Security!);

(d) the Reconstruction and Development Programme (RDP) with its five pillars – meeting basic human needs, building the economy, transforming the state and society, development human resources and nation-building;

(e) Accelerated and Shared Growth Initiative for South Africa (ASGISA) with its pillars – macro-economic issues, infrastructure programmes, sector investment strategies / industrial strategies, second economy interventions;

(f) the Provincial Growth and Development Plan (PGDP) with its six planks (public sector transformation, agrarian transformation, manufacturing diversification, infrastructure development, environment and tourism and economic growth and employment creation);

(g) and, our department's Green Revolution Strategy (a sustained social and institutional mobilization and organization for accelerated agricultural growth and development). This context is given substance through our strategies, integrated Development and Local Economic Development Plans.

The department will pay attention to the following key presidential priorities:

- Redistribution of 5 000 000 ha of white-owned agricultural land to 10 000 new agricultural producers. In this regard the Eastern Cape share of the commitment is 650 000 ha, of which 300 000 ha has been re-distributed to date.

- The commitment to increase black entrepreneurs in the agri-business industry by 10%. The ECDoA's activities through the Eastern Cape Rural Finance Corporation (ECRFC) and other Provincial institutions will provide significant assistance, guidance and resources to secure this priority.

- A commitment to provide universal access to agricultural support services to defined rural target groups involved in the above initiatives. The ECDoA's anticipated institutional development will assist in meeting this commitment.

- A commitment to increase agricultural produce by 10% to 15% and to increase agricultural trade by 10% to 15%.

- The priority of the ECDoA is in line with the Apex priorities and specifically, to speed up land and agrarian reform. This will require the acceleration of the acquisition of land for redistribution and ensuring that there is intensive training and specialist support to new formerly disadvantaged farmers.

- The plans, strategies and resources of the Eastern Cape Department of Agriculture are directed towards securing the commitments represented by the above priority undertakings.

The department will continue to align itself with the key national priorities as outlined in the Agriculture Programme of Action (APoA) i.e.:

- NSP1 Broad based AgriBEE and integrated food security
- NSP2 Sector investment, labour absorbing and competitive value chains
- NSP3 Bio-security and disaster management
- NSP4 Research, extension, education and training
- NSP5 Cooperative government and building of partnerships

The Managerial Pillar

This is the back-office centre of the strategic plan. The back-office has, amongst others, two critical interfacing responsibilities – strategic functions analysis and definition (primary) and task analysis and definition (secondary and diminishing). The politico-managerial interfacing is underpinned by the analysis of the elements of the political pillar in order to be able to define strategic functions for the Department. This is the arena of interface between the managerial and the operational pillars and marks the point of diminishing direct influence by the back-office and the rise of direct influence and control by the operational pillar. Full support of the Political Pillar and is primarily driven by the Senior Management and they cover the following functional areas within the department (Strategic Plan, 2009).

The Operational Pillar

This pillar moves from the analysis and definition of tasks, through the analysis and definition of the demands of each task (inputs), analyzing and defining activities for each

task, costing each activity or set of activities, deciding on the mode of service delivery, project design, procurement of goods and services and implementation of projects.

As can be seen here, the managerial-operational interface is characterized by the analysis of strategic functions to define tasks to be performed in the execution of such functions. This is the primary task of this pillar and serves as an organic link between it and its managerial counterpart.

There are two phases in this pillar – the phase from the analysis of strategic functions and definition of tasks through to the designing of projects; and, secondly, the phase from project design to project implementation. The work which separates into the two phases is further complicated by roles and role-relationships inherent in this pillar. There are two phase in this pillar – the phase from the analysis of strategic functions and definition of tasks through to the designing of projects; and, secondly, the phase from project design to project implementation. The work which separates into the two phase is further complicated by roles and role-relationships inherent in this pillar (Strategic Plan, 2009).

3.7.4 Environmental Feed-Back Pillar

The strategic plan serves as a guide to the Department so that it is effective, efficient and equitable in service delivery. At the beginning we indicated that the political mandate originates from the political party that has been put into power by the electorate. In essence, indeed the government, forms part of input from the environment within which the Department operates. The Department responds by providing services (outputs) back to the environment, in line with the input represented by the governing party's election manifesto. But the delivery of services to communities and individuals in the environment is subject to values, norms, legalities, standards, quantities, qualities, preferences and priorities. Furthermore, it is subject to time, place and politics.

These are elements of the environmental feedback pillar, most of which are qualitative in nature and very difficult to understand without getting directly involved. Even those that are quantitative in nature as constrained by availability resources, including

finances, material and human capital. The department has adopted a policy to engage with all its stakeholders regularly, as part of the feedback mechanism. This policy is in line with the overarching objective of Batho Pele. The systematic approach to the strategic plan is part of the Department's response to those inputs by stakeholders.