



1966 – 2016

"QOU VADIS" WHERE ARE WE GOING

PROCEEDINGS OF THE 50TH CONFERENCE OF THE
SOUTH AFRICAN SOCIETY FOR AGRICULTURAL
EXTENSION

6 JUNE – 8 JUNE, 2016
ST GEORGE HOTEL, CENTURION,
GAUTENG PROVINCE.

"QUO VADIS" WAAR GAAN ONS HEEN.

HANDELINGE VAN DIE 50^{STE} KONFERENSIE VAN
DIE SUID AFRIKAANSE VERENIGING VIR
LANDBOUVOORLIGTING

6 JUNIE – 8 JUNIE, 2016
ST GEORGE HOTEL, CENTURION,
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6 JUNE - 8 JUNE, 2016: ST GEORGE HOTEL, CENTURION, GAUTENG PROVINCE,
SOUTH AFRICA.**

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6 JUNIE - 8 JUNIE 2016: ST GEORGE HOTEL, CENTURION, GAUTENG PROVINSIE,
SUID AFRIKA.**

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Alle korrespondensie moet gerig word aan:

Die Sekretaris,

S A Vereniging vir Landbouvoorligting,

Posbus 20773,

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FOREWORD

It has become customary to have the conference proceedings available on CD-Rom. This year due to the Commemoration day and speakers on 7 June 2016, the CD is available only after the Conference to ensure that all the presentations are included. The CD also includes presentations of the previous year's SASAE Conference, namely 2015.

We are grateful to all the speakers for their contributions and for submitting their papers in time. Because of time constraints, the papers included in these proceedings have only been edited, where necessary, for print and appearance conformity, but have not been peer reviewed and are thus the sole responsibility of the authors.

SASAE Editorial Committee

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SASAE AWARDS: 2015 - 2016.

Awards Committee.

Every year the Awards Committee of the SASAE Board sends out letters to Members to solicit nominations for Awards of the Board. During 2015 – 2016 the Awards Committee proposed the following Awards to Members, which the Board approved:

1. AWARD CEREMONY 7 JUNE 2016

During the Gala Dinner of the Annual Conference we had an Award Ceremony where Members were awarded according to the criteria in the SASAE Awards Bylaws.

1.1 Tim Bembridge Extension Management Award (Bronze)

The recipient of this award has made substantial management contributions to Extension on a continuous basis. This year the Award went to **Ms. M. L. Mbongo, of the Free State Branch.**

1.2 Transvaal Branch Floating Trophy

The trophy can be awarded to a person(s), or a team who in the opinion of the Board, has informed fellow Extensionists of a successful extension action or actions by means of a popular scientific article or articles, or any other appropriate communication. This year the Award was won by **Mr. M. Mokuoane, of the Free State Branch.**

1.3 SASAE Gold Medal

A Gold Medal may be awarded to a person (or group of persons) who have made outstanding contributions promoting the science and scientific practice of Agricultural Extension. The award is based on:

- Exceptional quality of scientific contribution(s) towards extension; and
- Exceptional contribution(s) in the fields of leadership and policy formulation in the broader context.

This year **Dr. J. B. Stevens (Joe) and Dr. B. H. Koch from the Central Branch** were both awarded with the SASAE Gold Medal.

1.4 SASAE Silver Medal

A Silver Medal may be awarded to a person (or group of persons) who have made a special contribution(s) promoting Agricultural Extension. Nominees will be assessed on the quality of published scientific papers and/or reports.

This year **Dr. E. M. Zwane of the Central Branch and Mr. L. de Beer of the Eastern Cape Branch** were both awarded with the SASAE Silver Medal.

1.5 Loubie Loubser Floating Trophy

This Award is for the most active Branch of the Society. This year the **Central Branch** won this Award.

2. POPULAR PAPER, SCIENTIFIC PAPER & BEST POSTER AT CONFERENCE.

These Awards were presented on 8 June 2016 at the Closing Ceremony of Conference.

During the conference, the participants were asked to evaluate all the papers that were presented at the Conference according to certain criteria and to nominate the **“Most Popular Paper”**.

This year the winner was **Prof. C. T. Kadzere and Prof. M. A. T. Poswal from the Eastern Cape Branch**, for the paper: *“South African agricultural extension: How to remain relevant in a borderless world”*.

During the Conference the Editorial Committee evaluated all the papers presented at the Conference according to a set of criteria to determine the **“Most Scientific Paper”**.

The winner was **Mr. J. W. Swanepoel, Dr. J. A. van Niekerk & Dr. M. Blum from the Free State Branch**. The title of his paper was: *“Improving agribusiness of emerging small scale farmers through good management practices in pluralistic advisory systems”*.

During the Conference we had a Poster Session where a number of posters were displayed. This year there were 16 posters. There was a panel who adjudicated the posters to determine the **“Best Poster”**.

The winner was **Mr. W. A. Gillespie, Ms. F. J. Mitchell & Mr. P Campbell from the KZN Branch**. The title of their Poster was: *“The cost benefit of technology transfer regarding knowledge of soil type and herbicide selection to commercialize emerging sugarcane farmers”*.

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SCRIPTURES AND PRAYER.

Pastor Joshua Sawa, from the Shining Light Service at the Moreletta Park Church.

Pastor Sawa read from Matt. 13: 18 to 23, The Parable of the Sower. He shared some thoughts on the passage and opened the Conference with a Prayer.

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WELCOME ADDRESS.

Xaba, G. O.¹

Programme Director, Mr Moodley, thank you for the opportunity. On behalf of the SASAE Board and its honourable Members, I would like to take this opportunity and welcome ALL the delegates to this 50th Commemorative Conference. We as SASAE were grateful for the big number of SASAE Members who attended, especially Gauteng and Free State for the big numbers you sent. We realized that some departments had financial problems, but were pleased that they could send some delegates especially Members of the Society.

The attendance from the provinces was indicated as follows: Gauteng 76; Eastern Cape 21; Free State 67; Kwa-Zulu Natal 38; Limpopo 8; North West 24; Northern Cape 18; Western Cape 22; Mpumalanga 32 and there are 9 International attendees. (Namibia, Australia, Ethiopia, Nigeria, and Tanzania).

The delegates from Academic Institutions, both Universities (UP, UL, FS, UMP, UKZN, UFH, & UNISA) and Agricultural Colleges (OSCA, CEDARA and Mangosuthu) you are also acknowledged and welcomed. We have Commodity Associations (SASRI & NWGA) as well Strategic Partners both national (SACNASP, Manstrat & SFT Consulting) and International (SARFAAS & GFRAS) who have also attended our Commemorative Conference. We are honored to have you and welcome you.

This year the Programme Committee tried to have papers of high quality. All the proposals for papers and posters were evaluated by the panel of the Programme Committee. Only the best qualified to be presented. In this year's conference we have encouraged more posters and will have a full poster session on Wednesday where the authors will have a chance to give an overview of their posters to all the delegates. They will have 3 minutes each after which the viewing of the posters will follow.

On behalf of the Board our sincere thanks to the Central Branch and the Organizing Committee for the hard work towards making sure that we have this Commemorative Conference.

As I am welcoming ALL of you today, I hope that through this conference and the papers to be presented in this coming three days, we are ALL going to learn something and go back to our respective corners to implement what we learned.

I, THANK YOU!!!!

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¹ President of SASAE. Email: gxaba@mpg.gov.za

WELCOME TO THE PROVINCE OF GAUTENG AND OPENING OF THE 50TH CONFERENCE OF SASAE.

Adv. John Nesidoni.²

THE PILLARS OF TRANSFORMATION, MODERNISATION AND RE-INDUSTRIALISATION

More than 35 pieces of policies, plans and strategies

- GCR Agri-Food Transformation and Development Strategy
- GCR Urban Agriculture Plan
- GCR Agro-processing Strategy
- GCR Protection of High Potential Agricultural Land
- GCR Agrotropolis

A big thank you to the SASAE Board for choosing Gauteng to host this year's Conference.

SASAE has a long history; it is good to nurture history. People tend to throw out the baby with the bathwater. It is important that our young people protect this organisation and keep it strong.

There are five points that I want to highlight today:

1. Governance is important

This is true from a governmental extension and sustainable development as well as a change perspective. If you do not keep record, if you don't follow up, if you don't follow codes it helps nothing. We need to understand where we fit into the bigger schemes of things. I worked as an extension officer, researcher, and many other positions. In any position it is important to see the bigger picture.

No person is an island. You need to understand where you fit in. Beware of becoming isolationists instead of part of network. Officials and professionals should know how they and their responsibilities fit into the Bill of Rights.

Extension officers are an important cog in the wheel of government. At parliamentary level our "bad" are often exposed, and the good not seen. We are measured on both compliance and service delivery. We take accountability and responsibility as a team.

2. Communication

When we are communicating we need to be aware of what we say with our bodies and mouth. It is not just about talking. There are a couple of rules that need to be kept in mind:

- respect;
- space to listen well;
- when my staff writes something, I afford them the respect to read what they write. Whatever the language of communication, check your grammar... it shows respect;

² DDG, Department of Economic, Environment, Agriculture & Rural Development, Gauteng Province, South Africa.

- titles: respect earned by who you are, not by your title. We need to be alert by how we use communication to reflect our professionalism. Just by using a person's first name will not make me relaxed when it comes to the quality of your work;
- how you communicate with clients.

3. Relations between a client and service provider

Service delivery to clients: it is our job to have the latest and best information. In reports from clients, the relations and perceptions of clients are sometimes seen as very negative.

How is our relation with information generators, i.e. with researchers, with academics? The relations with both industry and academics are important to harness information needed to serve your clients.

4. Professionalism

When it is raining and you visit a farmer, do not wear a suite. When someone visits me I look at how they are dressed. Look respectable, first impressions count. Clients will judge you, especially if you are a woman: women are judged even more in rural communities. How do you present yourself, how do you carry that information? Say if you don't now, "I will come back to you". Commit to time to come back and give right information. The whole delivery package shows that I am professional. Last but not least: Register with SACNASP!

5. Change

Change is the only constant that there is. Global powers are shifting, agriculture becomes more expensive. But there are a couple of things within change that is consistent: people will always need food. We are part of system that produces food. We should attempt to make agriculture sexy. Young people must think it is the sexiest profession ever!

Thank you

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SOUTH AFRICAN AGRICULTURAL EXTENSION: HOW TO REMAIN RELEVANT IN A BORDERLESS WORLD.

Kadzere, C. T.³ & Poswal M. A. T.⁴

ABSTRACT:

The objective of this paper is to explore how globalization has impacted agriculture and how Agricultural Extension in South Africa can remain relevant in a borderless world. Recent advancements in technology, including efficient air travel, and the signing of the General Agreement on Tariffs and Trade (GATT, 1994) have made the world borderless, a single global village with a single market. This has affected industry and service delivery alike, albeit differently in different countries and in some instances differently in an industry within a country. This paper examines how globalization has impacted agriculture in South Africa, and strives to grasp how to make extension more effective and relevant in the new world order.

1. INTRODUCTION

The birth of the Internet in 1983 (Leiner, Vinton, Clark, Kahn, Kleinrock, Lynch, Postel, Roberts, & Wolff, 2003) heralded fast-paced developments of the 21st Century Information Technology (ITC) revolution, and the knowledge-based economy (Forester, 1985). Popularization of the computer in the 1980s, (Leiner, et al., 2003) collapsed traditional country boundaries. This has impacted industry, politics and life differently among countries and within countries. A precursor to the ITC Revolution, was the development of safe air travel. When Wilbur and Orville Wright (The Wright Brothers) flew their rudimentary “flying machine” on the Outer Banks of North Carolina in 1903, (McCullough, 2015), little did they know how their “flying machine” would transform the world. In addition, the signing of GATT in 1994 by 123 countries further opened up global trade like never before. The GATT’s objective was to enable market forces to bring efficiency and uplift people from poverty. The impacts of globalization have been bitter-sweet depending on where one is. This paper explores how globalization has impacted Agriculture and how Extension in South Africa can remain relevant in a world with porous national boundaries.

2. METHODOLOGY.

In addition to extensive literature review, consultations with extension practitioners at all levels in the Department of Rural Development and Agrarian Reform (DRDAR) in the Eastern Cape, and with officers from Extension in DAFF were conducted. The authors also drew from their practical experiences serving agriculture in South Africa pre- and post- 1994, in other African countries, in the United States of America, and in Europe to synthesize this paper.

3. EARLY AGRICULTURAL EXTENSION IN SOUTH AFRICA.

³ Dohne Agricultural Development Institute, Private Bag X15, Stutterheim 4930, Republic of South Africa; Tel: +27(0)43 683 5439; Fax: +27(0)43 683 2890; Mobile: +27(0)60 997 4491 Email: charles.kadzere@drdar.gov.za

⁴ Dohne Agricultural Development Institute, Private Bag X15, Stutterheim 4930, Republic of South Africa; Tel: +27(0)43 683 5439; Fax: +27(0)43 683 2890; Mobile: +27(0)60 997 4491 Email: maxwell.poswal@drdar.gov.za

Agricultural Extension in South Africa started in 1925 (Koch & Terblanche, 2013), 7 years after the First World War (1914-1918). The objective was to disseminate information and grow agriculture. Extension then, included Home Economics for housewives and Land Service Clubs for school-going youth. The Extension Service received a boost when Faculties of Agriculture were established at the universities of Stellenbosch and Pretoria. During the Depression in the 1930s, the Dustbowl in the United States of America (US) resulted in the passage of the US Land and Soil Conservation Act (1935) and the creation of the US Soil and Conservation Department. Lessons from the Dustbowl led to the promulgation of the Soil Conservation Act in South Africa in 1946 as Act 45 of 1946 (Koch et al., 2013). The Act became keystone to many extension programs in South Africa.

3.1 One Country Four Extension Systems.

During Apartheid, extension was segregated into four quasi-independent systems; (a) for Blacks subsistence farmers in the homelands; (b) for White farmers, (c) for Indians in Natal sugar plantations (d) and for people of mixed-ethnicities, Coloreds. The fragmentation of the extension service reached deep into curricula at Colleges and Faculties of Agriculture. Curricula in “white” South Africa produced extension personnel with sound science and mathematics background to advise commercial farmers. The same cannot be said of all programs at colleges and universities in areas of the other three population groups. In particular, the Bachelor in Agriculture (B. Agric.) study program was deficient in science and mathematics, and graduated extension personnel to serve in the homelands. A retrospective analysis suggests that the B. Agric. program was created when the university could not find sufficiently qualified students to be admitted into the Bachelor of Science in Agriculture (B.Sc. Agric.). That would suggest that the B. Agric. program was conceived to boost student numbers and to save agriculture programs from collapsing at such universities. Little consideration was given to the fact that agriculture is an applied science, and that for extension staff to be effective, they need to have the scientific background of what they extend. This analysis meshes with Worth (2008) who writes that extension is in need of serious review, if it is to serve its purpose in agriculture.

3.2 Extension Post 1994.

Democratic South Africa amalgamated the previously separate extension systems into one, which is housed in the National Department of Agriculture, Fisheries and Food (DAFF), and implemented through Provincial Departments of Agriculture. Depending on where the new provincial boundaries fell, extension personnel in former homelands found themselves serving new clients, commercial farmers, they had never served prior to 1994. The challenge was, how could one advise commercial farmers whose production system is science and numbers based, when one’s B. Agric training did not provide that preparation? Similarly for former white South Africa extension personnel, their clients now included subsistence and smallholder farmers. And the challenge here was, how can one provide extension service to subsistence and smallholder farmers when one’s training did not provide for those systems, and one does not understand the language and culture of one’s new clientele? These scenarios presented professional challenges and frustrations to extension staff. There should have been deliberate retraining and reskilling to capacitate extension staff to succeed in their roles, post 1994. That omission may be reason why literature suggests that the current Extension Service is ineffective (DAFF, 2008).

3.3 The Need for Collaboration in Extension, Research and Training.

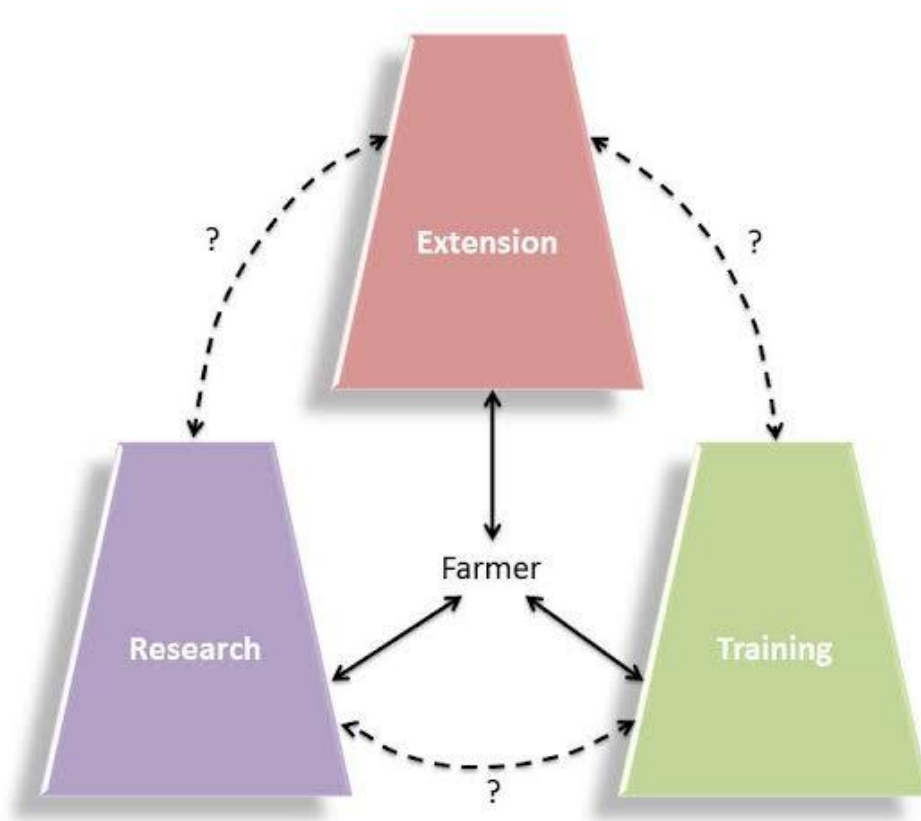
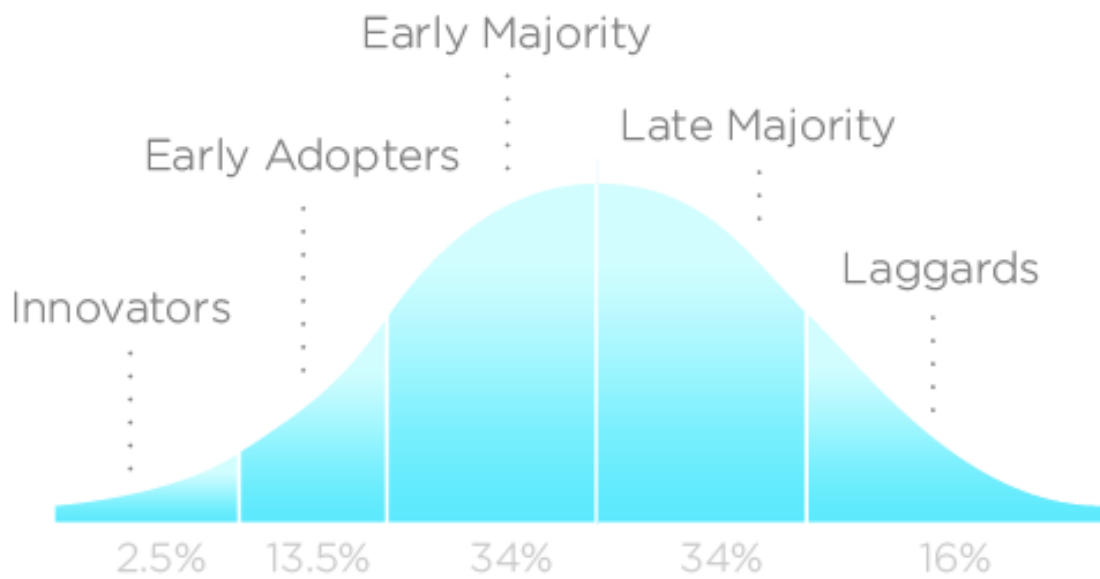


Figure 1. “Silo” Services Delivery/Extension Model

The “silo” model of services delivery in agriculture adopted in 1994 (Figure 1) does not augur well for collaboration among extension, research, and training. In the “silo” model researchers conduct research, develop new technology, package the technology and pass it on to extension to bring it to farmers for adoption. In line with this model, the ‘technology adaption cycle’ follows Roger’s Bell Curve of Technology Diffusion (Roger, 2003) as in Figure 2.



INNOVATION ADOPTION LIFECYCLE

Figure 2. Roger's Bell Curve of Technology Diffusion

We postulate that if extension, research and farmers came together to draw out research questions based on the farmers' needs, and research uses the results to develop appropriate new technology to answer the farmers' questions as shown (Figure 3), then the technology adoption rate could be different from Roger's bell curve. We believe that farmers are most likely to readily adopt a technology that was developed to provide solutions to their questions. How exactly such a technology adoption curve would look like, would need empirical study.

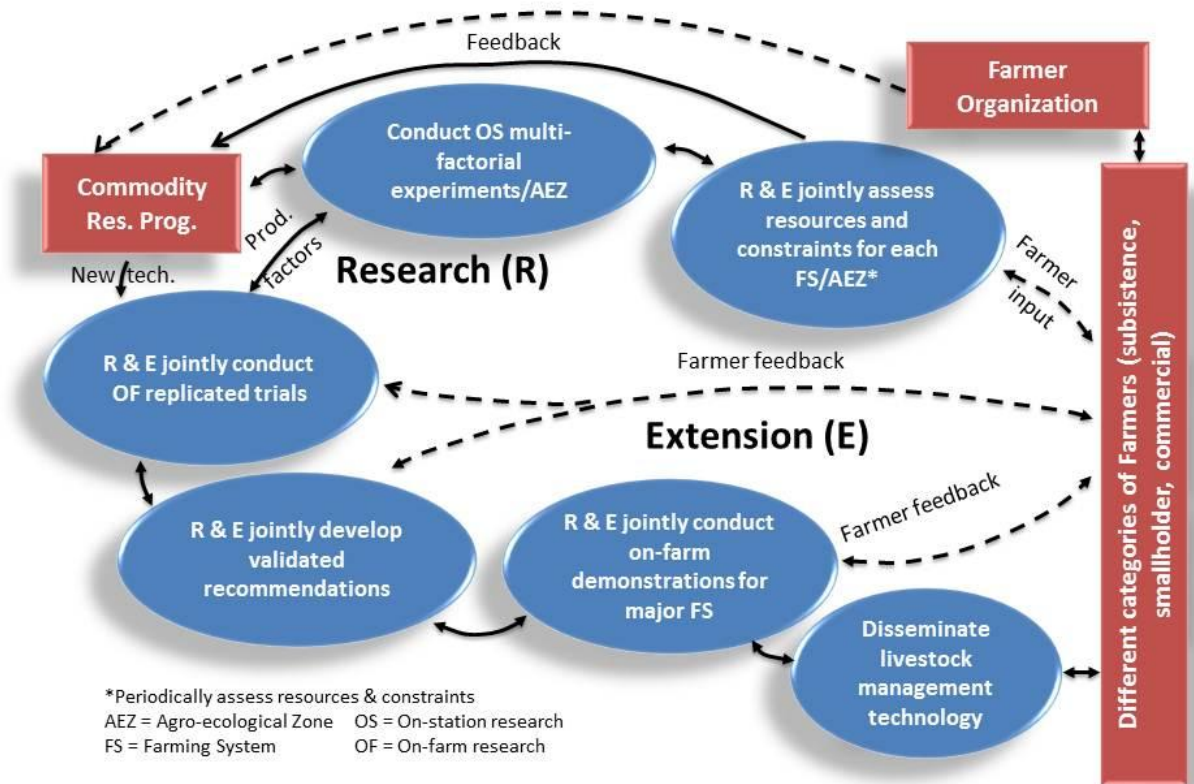


Figure 3. Proposed Services Delivery Model for South Africa. (Adopted from Swanson, 2013; and modified by Kadzere, 2016)

4. CONCEPT OF GLOBALIZATION AND BORDERLESS WORLD

Controversy over “globalization” arose ever since Levitt (1983) used the word for the first time in 1983. This is because globalization means different things to different people, and impacts economies at different levels of development, differently. According to Webster’s Dictionary to “globalize” means “to make worldwide in scope or application.” Thus, globalization is the bringing together of inputs and outputs into global markets, sharing of information and knowledge across porous country boundaries, and the promulgation of rules that govern such integration (Reddy-Deva, 2007). Collier & Dollar (2001) argued that globalization presents both opportunities and risks for developing countries.

4.1 Impact of Globalization on Agricultural Production

Globalization impacts South Africa’s commercial, smallholder, and subsistence farmers differently because these groups have different access and constellation to inputs and outputs. Globalization has a global market orientation and it tends to benefit commercial farmers that focus on export oriented cash crops and products (Reddy-Deva, 2007). On the other hand, globalization negatively impacts subsistence farming and household food security when men and the youth leave their families to go and sell their labor on the global market. In South Africa, that global market is represented by the mining industry and by the industries in urban and peri-urban centers. When men and the youth leave the rural areas, it undermines rural

economies and relegates farming to women and pensioners. This leads to underperformance in agricultural production (DAFF, 2008).

Further, Kumar (2009) suggested that between 1993 and 2003, close 100 000 Indian small scale farmers committed suicide in direct response to the impact of globalization on smallholder farmers. Shiva (2000) writes that globalization led to the integration of the seed industry, increased use of pesticides, and increased debt to small farmers. That made it impossible for small farmers to survive. In support of Shiva, Pollack, (2000) reports of the difficulty US university plant breeders have to get seed from private companies because of patenting issues. This undermines and negatively impacts public research. Rural farmers in developing countries traditionally have kept their own seed. However, in the borderless world, many native seeds have been replaced by hybrids, and hybrids cannot be kept for the next season's planting. This forces farmers to purchase seed every season. Reddy-Deva (2007) surmises that Globalization views farming as a business, whereas many in developing countries view farming as a living, and that explains why some countries have more than 75 % of their populations involved in agriculture.

4.2 Impact of Globalization on Agricultural Markets

Subsistence and smallholder farmers lack access to global markets and therefore they cannot sell their produce at higher prices and purchase cheaper inputs and better technology on the global market as does commercial farmers (Reddy-Deva, (2007). Further, South Africa does not pay subsidies to its farmers, and this disadvantages local producers on the global market. Subsidies distort the global market to the advantage of big players and multinational companies in developed countries, because they control both inputs and marketing channels. The distorted market jeopardizes the existence of smallholder and subsistence farmers. A perceptible way out of this quagmire is for farmers in developing countries to produce niche products that cannot be produced in developed countries. However, technology makes it possible to manipulate the environment which wipes out the climatic competitive advantage of developing countries.

4.3 Impact of Globalization on Agricultural Services Delivery

The pillars of services delivery in agriculture include research, extension, and training. Globalization has impacted services delivery differently in developed and in developing countries. For example, Canada now exclusively gets agricultural services “on the global market,” meaning it is completely privatized. This is comparable to some commercial farmers in South Africa that get their services from the “global market” through local and international consulting firms, instead of from extension. In that regard, globalization may have changed extension service from being a “public good” into a “private good.” When farmers get all their services privately, they become quasi-independent of government policies. How this could affect agricultural policies of countries whose farmers derive research, extension and training services from the global market remains to be seen.

Market-driven services delivery suits developed commercial agricultural systems. It is difficult to perceive how this will work in developing countries, especially in subsistence and smallholder agriculture. As we write, Uganda is experimenting with privatized extension services (GCARD3, 2016) through donor funding. How it will play out after the donor leaves remains to be seen.

5. SOUTH AFRICAN AGRICULTURAL EXTENSION IN A BORDERLESS WORLD

The Agricultural Extension can survive and thrive in a borderless world, if it proactively addresses issues that are hampering its effectiveness. First, there is need to change how it conducts business or shift its paradigm. The world is borderless, so extension has to remove its “silo” and start collaborating to mutual benefit with research and training. Collaboration enables extension to deliver services in a more integrated, holistic way, and have greater impact. Although the US land-grant model (Figure 4) is a proven effective model, South Africa cannot adopt it “*in toto*” without causing major structural disruptions.

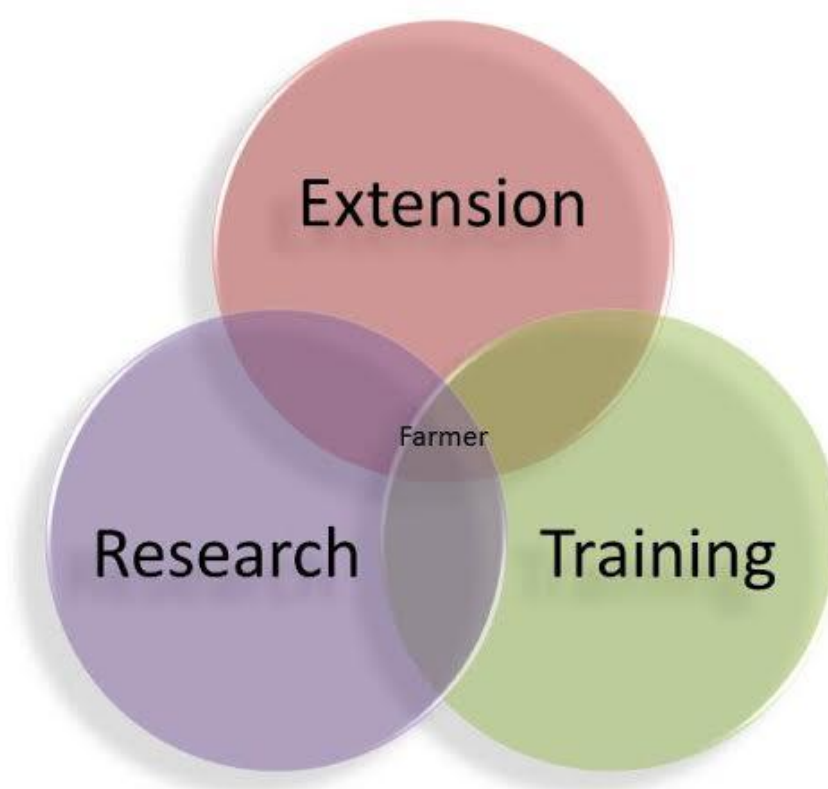


Figure 4. Tripartite Land-grant Services Delivery/Extension Model

Therefore the directorates of Research and Extension that are in Provincial Departments of Agriculture, are ideal starting points to break the “silos.” Collaboration can touch every aspect of the research project cycle, from project inception through implementation to dissemination results and new technology. That way, extension will not only remain relevant, but will thrive in a borderless world (**Figure 2**). In the proposed model, extension, research and farmers arrive at research questions together, guided by the farmers’ needs, and therefore it is logical to expect that the technology diffusion curve will be different from the conventional Roger’s bell curve of technology diffusion, and will be skewed towards large early adopters.

In the proposed model (**Figure 2**), the third pillar in the land-grant system, training, can be accessed from universities, through Memoranda of Understanding (MoU) between Faculties of Agriculture and Provincial Departments. The MoUs will provide access to Departments of

Agriculture of skilled human capital that tertiary education institutions harbor. The arrangement also benefits universities in that student training in agriculture and their research portfolios will be more attuned to real world burning issues.

5.1 Success and Failure in Extension

Today's successful commercial farmers are the products of effective extension at some point during their development, and of deliberate government support to enable them to succeed. Similarly, the failures of today's black agriculture in former homeland areas can be traced back to misaligned and discordant deliberate apartheid policies implemented through homeland governments that created the ineffective, inefficient and resources wasteful extension system.

5.2 Extension Should Focus at Training the Next Generation of Farmers

To address the issues raised above, extension should take stock of its deficiencies, correct them and start to focus on being the best they can ever be. Extension should invest in developing the next generation of farmers in an age where information is readily accessible. Extension is the vehicle and conduit that brings farmers and researchers to the table and brings research results and new technology to the field. Because knowledge today is generated at a faster pace than ever before, extension should commit to keeping at the cutting-edge of what they extend, if they are to remain credible and relevant.

5.3 Agriculture and Extension Curricula Review

To enable extension to achieve its goals in a borderless world, tertiary education institutions need to review their curricula and sunset creations of apartheid education system such as the B. Agric. degree program. While natural science principles are universal, they should be taught to reflect the environment in which students find themselves in. Local examples enthuse students as they enhance learning by building on the students' prior knowledge that they informally acquire from their environments. Agriculture is local! Therefore, the incorporation of local materials in the curricula will help students to identify themselves with what is taught. Further, hands-on practical learning should, where possible, be part and parcel of the curricula. This is important because, one can only extend what one understands and can do. In addition, to hard-skills, extension curricula should incorporate "soft-skills" including critical thinking, problem solving, creativity, communication, social skills, teamwork, ethics, and perseverance. These skills are essential for any profession to remain relevant in a borderless world, but more so for extension.

5.4 Professional Development and Life-long Learning

Young extension recruits should be put through rigorous induction and in-service training to familiarize them with their roles and responsibilities. That capacitates them to succeed. Further, inductees should be assigned to mentors, who will help them among others, draw Professional Development Plans, and assist them in acquiring life-long learning skills.

5.5 Extension Specialist vs. Generalist

The borderless world has numerous micro environments. Whether extension staff should be generalists or specialists depends on the environment in which they serve. Extension staff

working in rural areas with subsistence and smallholder farmers need to be generalists, with an ability to access specialist information when need arises. On the other hand, extension personnel working with commodity groups, must have specialist knowledge of their commodity. Even at this level, the extension specialist must have access to even higher specialist knowledge at Research Stations and/or at the universities, which they can reach should the need for extra special information arise. This scenario illustrates the importance of research, extension, and university collaboration as proposed in our model above (**Figure 2**).

5.6 One-size Does Not Fit All

In a borderless world, extension personnel must be perpetual learners, if they are to remain relevant. When any issue arises that impacts agriculture, no matter how remotely, the credible extension personnel will seek for immediate skills upgrade individually, or through formal means, in order to be conversant on the issue(s). On the other hand, extension administrators need to find ways to encourage, nurture, and reward personnel that keep at the cutting-edge of their professional responsibilities. The same technology that has made the world borderless is useful in keeping extension staff up-to-date. For example, webinars provided by world-class specialists, from anywhere in the world, can be attended by anyone on the global village. The time spent in upgrading skills is good investment that will pay dividends in effectiveness and efficiency in service delivery. Below are examples of issues that extension staff in the South Africa should be conversant with:

- How best to provide services to HIV positive farmers and to disabled clientele?
- How to infuse and promote climate smart agriculture in their programs?
- With increased urbanization, extension personnel should be conversant in, and be able to promote urban and peri-urban agriculture, and household food security issues;
- Land redistribution, how best to utilize communal lands, especially communal grazing lands without experiencing? “The tragedy of the commons.” (Hardin, 1968).
- The commodity approach requires extension personnel to be competent to work with commercial agriculture and commodity groups and their respective value chains;
- In a globalized world technology is indispensable, therefore extension personnel should be comfortable to use technology to enhance service delivery.

5.7 Extension Opportunities in Technology

Technology enables extension to reach far more people simultaneously than ever before. Because of that, extension personnel using borderless technologies need be extra careful in fact-checking before they disseminate information. When inaccurate information is sent to many people, as is possible with the internet, it is difficult to retract the misrepresentation. That can ruin credibility. The same technology that makes the world borderless, also makes one’s mistakes be available to the world. Extension staff in today’s borderless world must be extra careful in the discharge of their responsibilities.

Mobile phones are great equipment that extend the extension personnel’s reach. Extension personnel can relay farmer questions from the field to specialists in the labs, at universities, or anywhere, and get real time responses. Judicious use of modern technology to develop biological and economic models has become an invaluable resource for extension to show farmers pictorially, how the interventions they suggest could impact their bottom line. Possibilities in the borderless world are unlimited, but so are the dangers.

6. CONCLUSION

This paper broadly examines how globalization has impacted agriculture and seeks to strategically position South Africa's Agricultural Extension through changing how it does business, and it considers alternate, more effective services delivery approaches than the "silo" model. Effecting the changes discussed in this paper will go a long way toward making Agricultural Extension more effective, impactful, and more relevant in a world with porous national boundaries.

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IMMERGING CHALLENGES IN AGRICULTURAL EXTENSION IN SUB-SAHARAN AFRICA AND THE ROLE OF EXTENSION PROFESSIONAL SOCIETIES.

Mutimba, J.⁵

ABSTRACT

A key and indispensable precondition to agricultural development in sub-Saharan Africa is the existence of motivated frontline extension workers with the requisite knowledge and skills to drive the agricultural modernization process. However, of late, extension has been operating in environments that inhibit its effectiveness. For example: there has been turmoil in the provision of agricultural extension services in several countries with some countries literally dismantling the extension function of the ministries of agriculture – and it is not clear what has informed these changes; there is currently a push toward value chain extension where markets have become largely informal; and, research, universities and extension do not seem to be pulling in the same direction. The paper discusses these challenges and the effects they are having on extension delivery and uses anecdotal and empirical evidence from studies conducted in several countries. Basically, this paper argues that extension is not fully effective as the conditions for effectiveness do not exist. Consequently, the paper argues that extension professional associations like the South African Society for Agricultural Extension will have a pivotal role to play, as we move forward, in bringing back sanity in the extension profession by researching and documenting success and fail examples that can inform policy makers.

1. INTRODUCTION

A key and indispensable precondition to agricultural development, especially in smallholder agriculture, is the existence of motivated frontline extension workers with the requisite knowledge and skills to drive the agricultural modernization process. If agricultural development does not take place at the farmer level, it is unlikely to take place at any other level. To this extent, it is no surprise that, when no perceptible improvement takes place at the farmer level, the blame lies squarely on the shoulders of extension. Extension workers, therefore, drive the agricultural modernization process and, like a colleague at Mekelle University (Tekleyohannes Hailekiros) once said, ‘the rest of us are support staff’. When you come to think about it, this is so true. Whether you are a lecturer, a professor, a dean, a researcher, an extension director, a head of a non-government organization – if your mission is to develop smallholder agriculture at farmer level, you are supporting the field extension worker to achieve your/farmers’ goal. However, challenges abound that threaten not only the effectiveness of extension, but its very existence. Many of them stem from the poor understanding of the concept and practice of ‘agricultural extension’ (see Mutimba 2014).

This paper focuses on three challenges (structure, capacity, coordination) and calls for a strong role for professional societies like the South African Society for Agricultural Extension (SASAE).

2. CHANGES IN STRUCTURE FOR EXTENSION PROVISION

⁵ Winrock International, Sasakawa-SAFE, P. O. Box 24135, Code1000, Addis Ababa, Ethiopia. Email: jmutimba@winrock.org, Cell +251911802563.

The setting for agricultural extension in Sub-Saharan Africa is changing with many countries experimenting with different forms of decentralization. While it is not clear what informs these changes, the argument usually given for decentralization is that of improving efficiency, effectiveness and relevance of extension through: increased participation of farmers; improved extension accountability to farmers; improved extension responsiveness to farmers' demands; and, timely access to advice by farmers.

However, neither the mechanisms for, nor the form of, decentralization is clear – but if the reasons are genuine, one needs to ask and answer the following questions before changing the existing structure:

- What data and information is there to show that the current structure inhibits the efficiency of extension?
- What data and information is there to show that the current structure inhibits effectiveness of extension? Given the difficulty of assessing effectiveness of extension (see Christoplos, Sandison, & Chipeta, 2012) it would also be interesting to see how the data and information would have been generated.
- What data and information is there to show that the current structure inhibits the relevance of extension?
- What are the key indicators of farmer participation? What is hindering farmer participation now? How will the new structure enhance farmer participation?
- What are the key indicators of extension responsiveness? What is hindering extension responsiveness now? How will the new structure enhance extension responsiveness?
- What are the key indicators for farmers' timely access to advice? How does the current structure inhibit farmers' timely access to advice? How will the new structure enhance farmers' timely access to advice?

Many of the initiatives toward decentralization have been simply transfer of the extension function from one government department in the ministry of agriculture to another government department in the ministry of local government without mechanisms for getting closer to farmers. In fact, it is not clear how extension can be closer to farmers via the ministry of local government – a ministry with a range of other priorities and no special disposition to agriculture. How does handing over the extension function to local government, lead to increased farmer participation in extension programs? How does this bring field extension workers, who are already in the field by the way, closer to farmers? If extension reports to district councils – these are not farmer representatives, they are political representatives.

If the aim is to strengthen farmer participation, then decentralization should be preceded by farmer institutional development and strengthening. Not only will this provide a network of farmer organizations that extension can engage with, but the farmers will have capacity to demand services.

As Mutimba (2005) points out, a primary pre-requisite for effective farmer participation is the existence of strong farmer organisations that are able, motivated and sufficiently independent to effectively represent their interests. For decentralized extension systems to be effective, there will be need for strong, viable and self-sustaining farmer organizations that are able to, among other things:

- identify their own problems and seek ways and means to solve them;

- seek ways and means of developing their technical and management knowledge and skills to better plan, implement and evaluate their programs;
- take collective actions for the common good of their members;
- take collective action in lobbying for better services from extension and other services providers;
- monitor and evaluate performance of delivery services;

Strengthening farmer organizations is a more realistic and practical strategy for achieving the objective of *improved efficiency, effectiveness and relevance*, as strong FBOs will demand services, accountability, responsiveness and they will participate in developing and implementing programs.

In Malawi, Rwanda, Tanzania and Uganda, extension is now accountable to district local government with the ministries of agriculture having very little influence on what goes on at district level. In both countries the changes have led to low morale among field extension staff as extension is managed by non-extension professionals with all the consequences that this entails. The district officials do not have full appreciation of extension. They, therefore, do not prioritize extension in the allocation of resources; and, they do not consider capacity development as important. Field extension workers therefore feel like ‘orphans’ (Nzallawahe, Director of Crop Services, Tanzania, 23/10/2015, personal communication) with nobody taking care of their technical capacity needs. The lack of in-service training and technical backstopping limits their capacity to meet farmers’ changing advisory needs. Apart from the frustration arising from their inadequacies in meeting farmers’ needs, the staff has no prospects for professional growth and has no clear career progression path – a condition which does not encourage high performance.

In Rwanda, because of the broad mandate for local government, extension workers are assigned other duties like monitoring road and house construction (Swanson, Mutimba, Remington, Adedze & Hixson, 2011). These duties are not only at variance with good extension practice, but they also reduce the focus and time extension workers have with farmers.

Under pressure from the World Bank, Uganda went even further with these changes, and literally dismantled the extension function of the Ministry of Agriculture, and attempted to introduce a cost-sharing approach which it abandoned after 10 years of experimentation. The experiment failed. Only 10% of the farmers received extension services and there was a decline in real growth in agricultural output (Rwamigisa & Birner 2011). The government is now reconstituting its Ministry of Agriculture but, again, in ways that do not show full commitment to setting up a full-fledged specialized extension service. The government has deployed military personnel to distribute inputs after giving them a two-week training in extension at Makerere University.

It would also appear that, as the decentralization agenda is usually donor-driven, the commitment to make it work is usually not there within the national systems. In Malawi, there has been reluctance to devolve power and there has been confusion regarding the roles of traditional authorities (Kaarhus & Nirenda, 2006).

Swanson & Samy (nd) see two levels in a decentralized extension system: first, the ‘central level of an extension organization’ with the *provision function* – national priority setting,

strategy formation and financial planning issues; second, ‘local level of the extension system’ with the *production function* - location-specific service delivery.

Ethiopia has decentralized along similar lines – and in a way that agricultural extension professionals are in charge of the extension function at the lower levels. The Federal Ministry of Agriculture retains the *provision function* (sets policies, priorities, strategies and mobilizes resources); while the *production function* has been decentralized to eight regional levels each headed by an agricultural bureau head. The production function is further cascaded to all the districts throughout the country. Each regional bureau head is fully responsible for agricultural extension in his/her region. Agricultural human resource development remains a central issue of the Ministry and the Federal Government in general. Over the past 15 years the number of universities has risen from 3 to 33 – with most of them offering agricultural training programs. The number of agricultural diploma holders has risen from about 3000 to 72000 – and most of these are employed as frontline extension workers.

It would also appear that countries do not learn from each other’s experiences. The decentralization of the field extension function from one government department to another government department was tried in Zimbabwe and abandoned in the mid-70s because of dissatisfaction from field extension staff arising mainly from the fact that they were being supervised at district level by non-agricultural professionals which was causing low morale.

3. EXTENSION CAPACITY BUILDING

Frontline extension workers are inappropriately trained for the work that they do. The majority have no extension training – and there are several reasons why this is so.

3.1 Extension is not recognized as a specialized discipline

Most universities do not teach extension (see also Worth, 2008) and, if they do, it is in the form of an elective or introductory service course given to students pursuing degrees in other agricultural disciplines. Because of this lack of understanding, these universities do not even have departments of extension – and the people who teach the odd extension course are usually placed in departments of agricultural economics. I have never understood the rationale behind this structuring. Universities’ focus on agricultural ‘science’ training and do not realize that getting the agricultural science ‘right’ in one thing, while getting the agricultural science to work for smallholder farmers is quite another.

3.2 Belief that anybody can do extension.

There is a (mistaken) belief that anybody can do extension. That is why there is no extension training at most universities; that is why people with no extension training are employed to do extension; that is why extension is being decentralized to district local governments in some countries; that is why, in some ministries of agriculture, there are no directorates of extension; that is why, in some countries, people with neither extension nor agricultural training are appointed to manage extension; that is why, in Uganda, even military personnel is engaged to carry out some extension functions.

3.3 Employers do not articulate their needs for extension training

For many employers, especially Ministries of Agriculture, things are usually OK as they are – and they do not see any need for changing them. They take whatever they are given by universities with the belief that universities know what is good for them. As a result, universities see no need for extension training. As Sutz (2005) points out, universities are not isolated institutions. They are socially embedded, and their guiding visions are influenced by local history and traditions. This status quo is therefore self-reinforcing – see Figure 1 below.

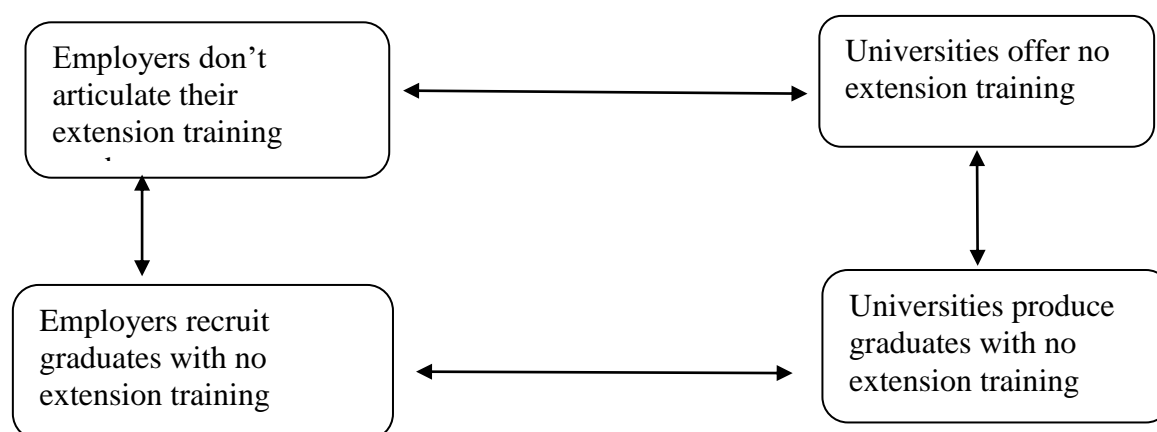


Figure 1: Self-reinforcing status quo for no extension training

To break this cycle, employers need to articulate their needs to universities – and the Department of Agriculture in South Africa should be commended for taking the initiative to break the cycle. After realizing that there was a growing number of degree holders doing extension but without extension training, the Department has approached the Ministry of Higher Education and, together, they are now in the process of addressing this issue. We had a workshop on this at the Ministry of Education Offices in November last year (2015).

Having realised that graduates come out of universities inadequately qualified for extension work, the Department of Agricultural Technical and Extension Services (Agritex) in Zimbabwe created a Training Branch which offers a whole range of in-service training courses, including extension soft skills, to extension staff. However, the Department has not been successful in engaging universities to ensure that they embrace extension training in their curricula.

3.4 Changing competency needs

Apart from the inadequacies of extension training referred to above, changes in farmer extension needs call for continuous in-service training. For example, recently, there has been a growing realisation that small-scale farmers in Sub-Saharan Africa can increase their incomes substantially by processing and adding value to their produce. In fact, currently, instead of adding value, they actually reduce the value of their produce through the methods they use for harvesting, processing and storage. When they thresh their crops by using cattle to trample over the crop as shown in Figure 2 below, they are reducing the value through soil, urine and dung contamination, and some seeds will be lost thereby reducing yield recovery. When they tie and hang their chicken upside down on a bicycle or donkey (see Figure 3 below) to take them to the market, they are reducing the value of the chicken. When they harvest their fruits prematurely to take them to the market (see Figure 4 below), they are reducing the value of the fruits.



Figure 2: Farmer threshing wheat



Figure 3: Farmer taking chicken to market



Figure 4: Fruits harvested before they were fully mature

Part of the reason why small-scale farmers do not engage in value addition is that, historically, the extension services in these counties have been focused on improving production and productivity (Gebremedhin, Hoekstra, & Tegegne, 2006). Extension services are structured for this production focus. University training also has a strong production orientation.

The Sasakawa Africa Fund for Extension Education (SAFE), in partnership with Winrock International⁶, has had some success in encouraging universities to come up with value chain-oriented curricula. However, several challenges have affected the effective implementation of the value chain-oriented curriculum.

3.4.1 Retooling teaching staff

University teaching staff generally lacks the experience necessary to teach practical-oriented programs. They are themselves products of theory-based production-oriented programs and most of them are recruited immediately after graduating. They therefore can only teach what they know from what they were taught. During a discussion with the Dean of the Faculty of Agriculture at Makerere University some years ago, he wondered how we were going to achieve the practical aspects of the program, giving examples of lecturers who ‘cannot even

⁶ Sasakawa/Winrock program promotes the in-service training of field extension workers through a B.Sc. program for mid-career extension professionals which is now run at 24 universities in nine African countries (see www.safe-africa.org for details).

milk a cow but are teaching Animal Science on the program’. Indeed, although we believe we are running strong practical-oriented programs, the devil has been in the implementation.

Finding teachers to teach them has been a challenge. There is very little literature of practical relevance. When President Museveni was the Chancellor of Makerere University, lecturers went on strike demanding more money to buy books. He asked them where they wanted to buy books from. He asked them why they wanted to buy books written by professors from other countries – which may not be appropriate for Uganda. As they were also professors, he asked them why they could not write books relevant to Uganda – and he refused to give them additional money and challenged them to also write books

In the same vein, we, in the Sasakawa/Winrock program, have also found it practical to encourage instructors to develop and/or adapt their own instructional materials for the courses they teach. That way, we are able to generate more appropriate teaching and learning materials than trying to buy books written in far-away countries with little local relevance.

Through this process we facilitate self-teaching and learning through workshops and individual explorations for information. For example, we are currently in the middle of developing instructional materials for pastoral and agro-pastoral systems.

3.4.2 Application of the value chain concept

The second problem, which is related to ‘retooling teaching staff’ above, has to do with how the value chain concept is taught. We have had challenges with professionals who make a living out of articulating the value chain concept – it is an industry to them. They make it look like ‘rocket science’ with maps and arrows facing all over, giving examples from the motor and clothing industries – with no relevance to smallholder farmers – when, in actual fact, what the farmer needs is much simpler. The smallholder farmer needs to know what the market options are; the quality that those markets want; and how s/he can produce the product and get it to the market in a state the market wants it.

Unfortunately these are missed out in the training of extension workers who are then left to figure out how to assist farmers benefit from available market opportunities.

3.4.3 Unavailability of markets

Most countries across sub-Saharan Africa have abandoned marketing boards. When I first joined extension, there were marketing boards for all the major commodities like grain crops; cotton; tobacco; coffee; tea; beef cattle; dairy; and, pigs. For all the commodities, the marketing boards would announce minimum prices (pre-planting prices for crops) well in advance before the start of the season. Farmers were then able to decide the enterprises to engage in depending on what they saw as the best value for their efforts. They would also decide, for example, whether to put their maize through pigs, beef cattle, poultry or dairy, instead of selling it as grain to the Grain Marketing Board. Farmers would get a guaranteed minimum price and, if the marketing board managed to sell the commodities at prices higher than they had paid to farmers, they would make a supplementary payments to farmers – and farmers commonly referred to this as ‘bonus’. There was also a strong manufacturing industry which could provide an outlet for some commodities that the marketing boards would not buy. For example, Lever Brothers (now Unilever) would provide a market for sunflower.

With the removal of marketing boards, the markets for most of the smallholder farmers have become largely informal and dominated by middle-people who do not pay premium prices based on quality. There is, therefore, little incentive for smallholder farmers to invest in quality-oriented management levels. Without guaranteed markets, the best farmers can do is to produce based on hope that they will find a market. Extension is expected to link farmers to markets – but where markets do not exist, extension cannot create them, and extension is usually blamed when farmers get stranded with their produce.

Where the market system functions well, extension plays the vital role of advising farmers how to respond to market needs. The market needs stimulate innovativeness, entrepreneurship and investment by farmers, traders, middle people or persons (middlemen). Market needs stimulate cooperation among farmers to reduce transaction costs for sharing knowledge, buying inputs, selling produce and lobbying

4. POOR LINKAGE/COORDINATION BETWEEN EXTENSION, RESEARCH AND TRAINING INSTITUTIONS

Extension, research and training institutions do not seem to be pulling in the same direction. Research has been generating myriads of technologies without regard to their appropriateness to farmers – with extension carrying the blame for non-adoption of these technologies. In a survey of three countries in southern Africa (Swaziland, Zambia and Zimbabwe), Waddington (1993) found that out of 53 technologies, only 15 had led to any adoption by farmers. Of these, just three technologies, all involving new varieties, were widely adopted. Researchers should consider themselves lucky because many work for governments or international research centres where development of technologies is acceptable as evidence of achievement – whether the technologies are taken up by farmers or not. In the for-profit industry, designers lose their jobs when they design a product that nobody buys.

As discussed earlier, training at universities has not been sufficiently adapted to meet the needs of those working with farmers.

5. CONCLUSIONS AND RECOMMENDATIONS

Basically, this paper argues that extension is not fully effective as the conditions for effectiveness do not exist.

Decentralization and structural changes are causing turmoil in the provision of agricultural extension services in several countries with some countries literally dismantling the extension function of the ministries of agriculture. These changes usually result in the management of extension being placed under individuals with no agricultural training in general let alone extension training. As we move forward, extension professional associations like SASAE will have a pivotal role to play in bringing back sanity in the extension profession by researching and documenting success and fail examples that can inform policy makers.

Universities have been churning out graduates without extension training – and extension services have carried the blame for poor performance. Extension is grossly misunderstood and, hence, undermined. SASAE and other professional associations can play a pivotal role in raising the profile of extension. Getting science right is one thing, but getting the science to work for farmers is quite another.

Without markets, there are no incentives for farmers to invest in high volume and quality production. Professional associations, like SASAE, should call for the re-introduction and/or re-vitalization of agricultural marketing boards. This is a public good that governments should invest in. Professional associations should engage governments on this issue.

Researchers are churning out myriads of technologies without regard to whether the farmers need them or not. Professionals associations can play a role by generating evidence of why dozens of technologies have not been adopted.

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PRODUCERS' PERCEPTIONS OF CASP-EXTENSION SUPPORT WITHIN TSHWANE METROPOLITAN MUNICIPALITY, SOUTH AFRICA.

MafsiKANeng, A. N.⁷ & Afful, D. B.⁸

ABSTRACT

The study employed Bennett's Hierarchy of Evidence framework to try to understand how beneficiaries and non-beneficiaries perceive the CASP-Extension programme. The study was conducted in the Tshwane Metropolitan Municipality, South Africa. By means of cross-sectional approach, semi-structured questionnaires were used to collect data through personal interviews from respondents between November 2014 and January 2015. Survey respondents consisted of both CASP-Extension beneficiaries and Non-CASP extension farmers. The results revealed that receiving CASP-Extension support does not contribute to yield increase over non-recipients. Both farmer groups expressed positive sentiments about CASP-Extension support but Non-CASP Extension recipients were more critical of extension agents. This notwithstanding, most Non-CASP-Extension recipients have the ambition to receive CASP-Extension support and both farmer groups would recommend CASP-Extension support to other producers. CASP-Extension could improve its image amongst Non-CASP-Extension recipients by addressing the areas of dissatisfaction indicated by respondents in the study.

Key words: Comprehensive Agricultural Support Programme; Evaluation; Land Redistribution of Agricultural Development; Extension

1. INTRODUCTION

Under the South African apartheid government, legal impediments such as the 1913 and 1936 Land Acts (Brand, Christodoulou, van Rooyen & Vink, 1992) prevented the black farmers from obtaining enough farm land and benefit from the specialized service institutions including public extension services (van Rooyen & van Zyl, 1990). Among the post-1994 government reforms in the South African economy was the introduction of the land reform programme implemented through various initiatives such as the Land Redistribution for Agricultural Development (LRAD). The government adopted the Comprehensive Agricultural Support Programme (CASP) to provide support services and to facilitate agricultural development of LRAD beneficiaries and other farmers (Department of Agriculture 2005). The focus of this study was on the provision of public extension services to LRAD farmers within CASP (hereafter referred to as CASP-Extension).

According to DAFF CASP report (2012), CASP started with a budget of R200m in the first year of 2004/5, which increased to R300m in 2006/07, after which it continued to rise. Moreover, the funding of Government's Extension Recovery Plan (ERP) which is coordinated through CASP office, since its introduction in 2007 has seen a lot of cash injection to revitalize the public extension service (DAFF 2009).

⁷ Gauteng Department of Agriculture & Rural Development, South Africa.

⁸ School of Agriculture & Environmental Science, University of Limpopo, South Africa. Email: David.Afful@ul.ac.za. Phone: 015 268 3847

Public agricultural extension globally, however, is widely seen to be ineffective and not meeting the needs of users (Rasaga, Ulimwengu, Randriamamonjy & Budibonga 2013 citing Birner *et al.* 2009; Williams, Mayson, Desatgé, Shelley & Semwayo, 2008; Rivera, 1991). In South Africa, public extension has also been under the spotlight for many reasons. Some of the criticisms include the lack of relevance of extension information for farmers' needs, limited public extension support and advice for land redistribution beneficiaries (National Sample Survey Organization 2005; and Umhlaba Rural Services, 2007). Problems of accountability for investments in extension services have also been highlighted (Feder, Willet & Zijp, 1991).

The aim of the study is to understand the beneficiary evaluation of CASP-Extension program and how it can be used to improve future programme delivery. The study's specific objective was to assess farmers' perceptions about CASP-Extension regarding quality of the educational content of its program.

2. METHODOLOGY

By means of cross-sectional survey, semi-structured questionnaires were used to collect data through personal interviews from respondents between November 2014 and January 2015 in the Tshwane Metropolitan Municipality. Semi-structured questionnaires were prepared guided by the Bennett Framework (1975). The Framework provided for the essential factors in the analysis of respondents' perceptions of CASP-Extension, participation in CASP-Extension, changes in respondents' knowledge, skills, attitudes, aspirations; the consequences of CASP-Extension support for respondents in terms of crop yields.

Survey respondents consisted of the entire population of CASP-Extension beneficiaries (n= 30) and Non-CASP extension farmers were selected (n= 30) by systematic sampling.

The survey instrument was pre-tested on a group of farmers to check for clarity of questions and to minimize the length of the interview time in order to improve reliability.

Data collected were subjected to descriptive and inferential statistical analysis. Statistical Package for Social Sciences (SPSS) was used to analyse the data.

3. RESULTS AND DISCUSSIONS

3.1 Farmers' perceptions and attitudes about the quality of CASP-Extension Programmes

- **Extension officers' farm-management knowledge**

The correlation between perception and adoption behaviour (Koch, 1985) prompted an investigation into CASP farmers' perception of the quality of the educational content of its programmes. The quality of the extension service provided to farmers depends in part, on the knowledge of the agents. Respondents' views of extension officers' knowledge of their work regarding farm-management support for farmers based on farm size were assessed and the results are presented in Table 1. Most respondents who own more or less than 100 ha of farm land (82%) believed extension officers were knowledgeable. It is interesting to note that most livestock producers in the Eastern Cape of South Africa (83%) rated the efficiency of Extension agents as average to below average. The efficiency dimension included agents' knowledge and ability (Agholor, 2011). A Chi-Square test for independence (with Yates

Continuity Correction for a 2x2 table) indicated no differences in opinion regarding agents' farm management knowledge between owners of different farm sizes at 5% level (2 tailed tests).

Table 1: Distribution of respondents on extension officers' farm-management knowledge according to farm size, (N = 60)

Opinion	Less than 100 ha	%	100 ha and more	%	Total	%
Disagree	5.3	17.2	5.7	19.4	11	18.3
Agree	23.7	82.8	25.3	80.6	49	81.7
Total	29	100	31	100	60	100

$X^2 = .000$ $p = 1.000$ $df = 1$

- **Extension officers' attendance to farmers' request for farm-management assistance**

Respondents' attitudes towards the general quality of farm-management support were assessed on various dimensions. On each dimension, respondents were required to answer 1 (agree) or

0 (disagree) with the statement provided in the questionnaire.

The views of both Extension-support recipients and non-recipients on extension officers' attendance to farmers' requests for farm-management support (Table 2) shows most Non-CASP recipients compared with the Extension-support recipients said extension officers never attend to farmers' request for farm-management support. This view of Extension-support recipients runs contrary to a survey of Extension officers' technical team response to first aid treatment among livestock farmers in the Eastern Cape which revealed that the vast majority of producers said it was less prompt to no response at all (Agholor, 2011). A Chi-Square test for independence (with Yates Continuity Correction for 2x2 table) indicated a difference in opinion on extension officers' non-attendance to request for support between service type at 5% level (2-tailed test)

Table 2: Respondents' views on extension officers' non-attendance to farmers' request for farm-management support according to service type, (N = 60)

Opinion	Service Type					
	Non-CASP Extension		CASP Extension		Total	
	n	%	N	%	N	%
Disagree	5	16.7	21	70	26	43.3
Agree	25	83.3	9	30	34	56.7
Total	30	100	30	100	60	100

$X^2 = 15.271$ $p = .000$ $df = 1$

Respondents' views on extension officers' non-attendance to farmers' farm-management requests according to CASP enterprise are presented in Table 3. Most respondents from both enterprises (70%) have a positive attitude towards extension officers' attendance to farmers' requests for farm-management support. A Chi-Square test for independence (with Yates Continuity Correction for 2x2 table) indicated no differences in opinion on extension officers' non-attendance to request for support between CASP-Enterprise at 5% level (2-tailed test).

Table 3: Distribution of respondents on extension officers' non-attendance to farmers' requests according to CASP-Enterprise, (N = 30)

Opinion	Non – maize farmers	%	Maize farmers	%	Total	%
Disagree	9	55.3	12	85.7	21	70
Agree	7	43.8	2	14.3	9	30
Total	16	100	14	100	30	100

$X^2 = .965$ $p = 1.000$ $df = 1$

Respondents' views on this matter based on the farm distance from the local extension office are presented in Table 4. Contrary to expectations, most farmers whose farms were located more than or less than 30km from the local extension office had a positive attitude towards CASP-Extension on this matter. The Chi-Square test for independence (with Yates Continuity Correction for a 2x2 table) similarly produced no association between farm distances at 5% level (2-tailed test).

Table 4: Distribution of respondents on extension officers' non-attendance to farmers' requests according to farm distance from extension office, (N = 30)

Opinion	Less than 30 km	%	30 km and more	%	Total	%
Disagree	4.2	85.7	13.8	52.2	18	60
Agree	2.8	14.3	9.2	47.8	12	40
Total	7	100	23	100	30	100

$X^2 = + 1.312$ $p = .252$ $df = 1$

- **Agents' consideration of clients knowledge and experience**

Introducing participatory approaches is seen as a way to increase coverage and obtain commitment from the farmers and making extension programs more relevant (Düvel, 1998). To ensure sustainability and widespread adoption of recommended innovations, the current approach to extension work requires that agents work with farmers to arrive at solutions for their problems. This understanding prompted questioning respondents about agents' consideration of farmers' knowledge in looking for solutions for farmers' farm management problems. The views of CASP-Extension recipients and non-recipients on extension officers' consideration of farmers' knowledge and experience in making farm-management recommendations are presented in Table 5. Non-CASP recipients (70%) more than CASP recipients 33% did not agree with the claim officers consider farmers' knowledge and experience in recommending solutions for farmers' farm-management problems. The Chi-Square test for independence (with Yates Continuity Correction for a 2x2 table) produced an association between service types at 5% level (2-tailed test).

Table 5: Distribution of respondents on extension officers' consideration of farmers' knowledge according to service type, (N = 60)

Opinion	Service Type					
	Non-CASP Extension		CASP Extension		Total	
	N	%	N	%	N	%
Disagree	21	70	10	33.3	31	51.7
Agree	9	30	20	66.7	29	48.3
Total	30	100	30	100	60	100

$X^2 = 6.674$ $p = .004$ $df = 1$

3.2 Contribution of CASP-Extension to Farmers' Cropping Enterprise

The ultimate problem (need/goal) in agricultural production is an efficiency issue (e.g., profitability) or some facet of efficiency (e.g., yield per hectare, calving %) which can be traced to some aspect of behaviour, e.g., non-adoption of recommended practices or inefficient/improper application of recommended practices (Düvel, 1987). It is against this backdrop that an investigation was made into the contribution of CASP-Extension to the crop yield of recipients of CASP support. The effect of CASP-Extension on farmers' production (yield/ ha) was assessed by a comparison between crop yields obtained by CASP-Extension recipients and those who did not.

- **Producers' yield in the year preceding the study**

The mean maize yields (tons/ha) obtained by respondents in the year before the survey were assessed and the results show that contrary to expectations, the mean yield for Non-CASP recipients was 0.276 more than that of CASP-Extension recipients (Table 6). These might be attributed to the type of cultivars used, fertilizers used and time of planting. With regard to CASP-Extension recipients, the reasons might be planting late as it was the case where farmers have to wait for production inputs from the Gauteng Department of Agriculture which were often delivered late.

The differences in yield were subjected to independent t-test for statistical significance. The analysis indicated that the assumption of homogeneity of variance for the data of the two groups was satisfied (Levene's test; $p = .906$). The test revealed that the null hypothesis of no difference in the yields of LRAD farmers receiving CASP-Extension support and those not receiving such support is probably true ($p = .482$; 2-tailed test). This conclusion regarding 'no significant' yield differences for the two groups was supported by the fact that the 95% confidence band of the CASP and Non-CASP difference includes 0 (-.179 to 1.873). The magnitude of the differences in the means 0.276 was very small (eta squared = .022) (Pallant, 2007, citing Cohen, 1988). This finding is similar to Afful, Oluwatayo, Kyei, Ayisi, and Zwane (2014) who found a no significant difference in maize yields between respondents in some municipalities of Limpopo province who received public extension support including climate variability information and those who did not.

Table 6: Results of respondents' mean maize yields according to service type (N = 25)

Average maize production in tons/ ha	N	Mean	Standard Deviation	Standard Error
Non – CASP	11	3.654	.762	.229
CASP	14	3.378	1.087	.290

- **Overall rating of average production (ton/ha) in the last 5 years of receiving CASP–Extension**

The ratings for overall production for both Non-CASP recipients and CASP recipients were assessed in terms of production increasing, decreasing or no change at all. To assess the influence of CASP-Extension on recipients' production, their yields in the last five years of receiving CASP-Extension support were compared with non-recipients for the same period. A slight majority of respondents in both service types (59%) indicated yield increases. (Table 7). The Chi-Square test for independence (with Yates Continuity Correction for 2x2 table) showed a significant difference in yield trends between the two groups. Most CASP-Extension recipients (68%) compared with Non-CASP recipients (52%) reported yield increases.

Table 7: Distribution of respondents' rating of overall average production according to service type, (N = 59)

Opinion	Service Type					
	Non–CASP Extension		CASP Extension		Total	
	N	%	N	%	N	%
Increasing	15	51.7	20	66.7	35	59.3
No change	8	27.6	5	16.7	13	22
Decreasing	6	20.7	5	16.7	11	18.6
	29	100.0	30	100.0	59	100.0

$X^2 = 6.674$ $p = .004$ $df = 1$

3.3 CASP-Extension support recipients' satisfaction with overall quality of the support

Respondents' satisfaction with the overall quality of the extension training programmes for their crop production system is presented in Table 8. In the main, most respondents were satisfied (76.7%) with the training received. This finding is contrary though, to Agholor's (2011) study in the Eastern Cape of South Africa among livestock farmers where a vast majority of producers (87%) were unsatisfied to very unsatisfied with the public extension training received. A Chi-Square test of independence (with Yates Continuity Correction for 2x2 table) showed no association between type of enterprise and satisfaction with training attended at 5% level (2-sided test).

Table 8: Distribution of respondents on satisfaction of training attended according to CASP-Enterprise, (N = 30)

Opinion	Non-maize farmers	%	Maize farmers	%	Total	%
Disagree	3.7	31.3	3.3	14.3	7	23.3
Agree	12.3	68.8	10.7	85.7	23	76.7
Total	16	100	14	100	30	100

$X^2 = .440$ $p = .507$ $df = 1$

- **Applicability of training received**

Further probing into the training respondents received from CASP-Extension indicated that all respondents (n= 30; 100%) said that the knowledge and skills received could be applied on their farms. This again suggests the CASP-Extension was contributing to building respondents' capacity to be self-reliant in successfully managing their farming businesses. This finding is similar to the majority of livestock farmers' views in the Eastern Cape (70%) who reported that Extension training received enhanced the performance of their farming enterprises (Agholor, 2011).

- **Reasons for dissatisfaction with CASP-Extension support**

Even though respondents said that CASP-Extension was useful and applicable, a few of the respondents nevertheless, registered some dissatisfaction with the support provided. These are grouped under three main themes:

Training: One farmer (n=30; 17 %,) indicated that the reasons for dissatisfaction of training were that the training was not practical

Resource and production inputs: Most respondents (n=30; 60 %,) were not satisfied with the provision of resources and production inputs. They indicated that they do not have water, which is one of the basic farming needs. Farmers also bemoaned that the fact that the production inputs from the Department of Agriculture were sometimes delivered late, which affects the planting time and therefore, production.

Study group-related issues: With regard to the study group-related issues, one farmer (n=30; 17 %,) was not satisfied with the timing of the study group meetings which sometimes happens very early in the morning while farmers are busy with other farming activities. The farmer also indicated that farmers should be grouped according to their educational levels as in most cases extension officers use English in their sessions, whereas the majority of farmers do not understand the language.

3.4 Non CASP-Extension recipients' other views on CASP-Extension support

- **CASP-Extension support helps to increase farmers' yields/ or profits**

Farmers' awareness of the advantage of CASP-Extension support in helping to improve producers' yields or profits could be a positive force in attracting Non-CASP recipients to want to make use of the service. This view is consistent with Düvel's (1975) concept of relative advantages of innovations and their influence on adoption.

The respondents' opinions on CASP-Extension support in helping to improve producers to increase yields or profits provide some indications that most Non-CASP producers (n= 30; 60%) had a positive attitude about the contribution of CASP-Extension support regarding producers' yield increases. About 23 % of respondents had no opinion, though.

- **Producers' Intentions to Receive CASP-Extension Support**

To understand Non-CASP Extension recipients' behaviour with regard to wanting to receive CASP-Extension in future, their attitudes and beliefs about CASP-Extension were assessed and reported in the previous sections. This was done consistent with Azjen and Fishbein (1980). As expected, the majority of Non-CASP recipients (90%) said that they would like to receive such support in future. This indicates that producers see the farm-management support advantages of the service.

- **Recommendation of CASP–Extension support to other producers**

Most respondents (N= 60; 93.3%), both CASP and Non-CASP-Extension support recipients said that they would recommend the services to other farmers (Table 9). The Chi–Square test for independence (with Yates Continuity Correction for 2x2 table) produced no association between service types at 5% level (2–tailed test).

Table 9: Distribution of respondents' views on recommendation of CASP–Extension support to other producers

Opinion	Service Type					
	Non – CASP Extension		CASP Extension		Total	
	N	%	N	%	n	%
No	3	10	1	3.5	4	6.7
Yes	27	90	29	96.7	56	93.3
Total	30	100	30	100	60	100

$X^2 = .268$ $p = .301$ $df = 1$

- **Suggestions by respondents to improve CASP–Extension support**

Suggestions by both CASP and Non-CASP recipients on how to improve CASP-Extension support are grouped under two main themes (Table 10). Most of the inputs related to farm management support (66%) while about 34% were about government support or intervention.

Table 10: Respondents' suggestions on how to improve CASP-Extension support (n=35)

Themes	No	%
Extension farm-management support	23	65.7
Government support or intervention	12	34.3
TOTAL	35	100

- **The following specific suggestions were made about Extension farm-management support:**

1. Visit farms regularly and support should be consistent.

2. Extension officers should keep promises made to farmers.
3. Provide information on government programmes.
4. Listen to farmers' needs.
5. Study groups should suit farmers (time; similar educational level).
6. Address farmers in their own language to improve communication with farmers.
7. Training should be practical and linked to production activities.
8. Recognize farmers' knowledge and expertise.
9. Extension officers should sit in farmers' meetings to hear what farmers' challenges are.
10. Provide information or training on financial management, marketing management, hydroponics and animal health.

• **Respondents made the following specific suggestions about government support or intervention:**

1. Support should be provided to farmers irrespective of race.
2. Address land issues and theft on farms.
3. Target youth to venture into agriculture.
4. Provide resources to the farmers

4. CONCLUSIONS

The perceptions of the users and non-users of any service such as CASP Extension, is central to judging its quality. This dimension of CASP Extension evaluation is paramount to the program's continued use and therefore, financial support by government. The researcher therefore, attempted in this study to establish at least two important different views of some quality aspects of CASP Extension support to producers which are crucial to its sustained use. First, Non-CASP recipients have serious reservations about agents' attendance to farmers' farm management requests and the consideration of farmers' knowledge/experience before arriving at solutions for producers' farm management challenges. These are negative forces that prevent use of the service. Second, both CASP-Extension recipients and Non-recipients believe extension agents have the necessary farm management knowledge to support farmers' production and would recommend the service to other producers. These are however, positive forces which if well-managed can lead to more people wanting to use the service.

In view of the importance of perception on adoption of innovations, addressing the concerns expressed by Non-users of the service bodes well for future CASP service delivery and helps attract more service users.

5. RECOMMENDATIONS

In the light of the findings of this study, the researcher makes the following recommendations to improve future CASP-Extension support and CASP-Extension evaluation studies:

- Attention should be paid to the negative sentiments made by Non-CASP Extension recipients.
- Efforts should be made to address respondents' concerns on CASP-Extension farm-management support and issues about government support to farmers.

- Future studies that use regression analysis might overcome the bias in the findings arising from systematic pre-existing differences between the two groups involved in the study.

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CHALLENGES FACING THE AGRICULTURAL EXTENSION LANDSCAPE IN SOUTH AFRICA, QUO VADIS?

Davis, K. E.⁹ & Terblanché, S. E.¹⁰

Correspondence Author: K. E. Davis, kristin.davis@g-fras.org

ABSTRACT

According to the National Development Plan for South Africa there is a need for the training of a new cadre of agricultural extension advisors that will respond effectively to the needs of small-holding farmers. What is needed is a “best-fit” framework for designing and analysing agricultural advisory services namely: Policy environment; Governance (pluralism and participation); Capacity/competencies, technical and functional and the professionalising of the extension services (the South Africa case study). The role of SASAE in the way forward will be to: Determine continuously what the agricultural extension landscape will need in 10 years’ time; establish and implement a CPD Committee to ensure continuing professional development of extension advisors; and investigate the possibility to register as a training provider of skills programs in the science of extension.

1. INTRODUCTION

According to the National Development Plan for South Africa and its Vision for 2030, South African’s rural communities should have greater opportunities to participate fully in the economic, social and political life of the country. Rural economies will be supported by agriculture and possibly by mining, tourism, agri.-processing and fisheries (see Chapter 6: An integrated and inclusive rural economy). The following aspects were identified as essential, with special reference to extension advisory services in South Africa:

- “Improve and extend **skills development and training** in the agricultural sector, including **entrepreneurship** training and the training of a new cadre of extension officers that will respond effectively to the needs of small-holding farmers and contribute to their successful integration into the food value chain.
- For these extension officers to be successful, it is necessary to investigate whether extension and other agricultural services are appropriately located at **provincial level**. Innovative means for agricultural extension and training by the state in **partnership with industries** should be sought” (National Planning Commission, 2012, p. 206).

This is a clear indication that an effective and efficient extension advisory service is essential for successful rural development in South Africa. This document examines ingredients for effective, efficient advisory services, based on an international and local literature review. The purpose of the study is to identify challenges facing the agricultural extension landscape from a global perspective namely a best-fit approach and a framework for designing and analysing agricultural and rural advisory services that include:

- Policy environment
- Governance
- Capacity, management and organisation

⁹ ¹ Global Forum for Rural Advisory Services/International Food Policy Research Institute, **South Africa**.

Email: kristin.davis@g-fras.org.

¹⁰ ² University of Pretoria, South Africa Email: fanie.terblanche@up.ac.za.

- Approaches

2. CHALLENGES FACING THE AGRICULTURAL EXTENSION ADVISORY LANDSCAPE – A GLOBAL PERSPECTIVE

A desktop study of international extension and advisory research between 2001 – 2015 revealed a number of challenges facing the agricultural extension advisory landscape. The challenges are organised according to the ‘best-fit’ framework (Birner, Davis, Pender, Nkonya, Anandajayasekeram, Ekboir, Mbabu, Spielman, Horna, & Benin, 2009). This thinking is echoed by Rivera & Qamar (2003), who stated that “no two people are exactly alike”; it is important to realise that no single extension methodology is suitable for all situations and for all purposes. A ‘one-size-fits-all’ approach to sustainable extension and rural development programmes will not work. The need to develop location-specific extension approaches is essential and in line with developing situation specific food security strategies. The best-fit approach embraces both the pluralism of approaches used today and the diversity found within agricultural innovation systems (GFRAS, 2012). The framework for designing and analysing agricultural advisory services looks at the impact pathways and influencing factors for successful performance and impact of extension services. It starts with the contextual factors or ‘frame conditions’, including the policy environment (A), the general capacity of service providers (B), and the production/farming systems and community aspects (C & D). The framework then looks at the characteristics of the advisory service system that must respond to the frame conditions. These characteristics include governance structures (E), capacity (F), management (G), and extension techniques or methods used (H). The conditions and characteristics then affect the performance of the service (I), the response through capacity building and decision making of farm households (J) and leads to impact (K).

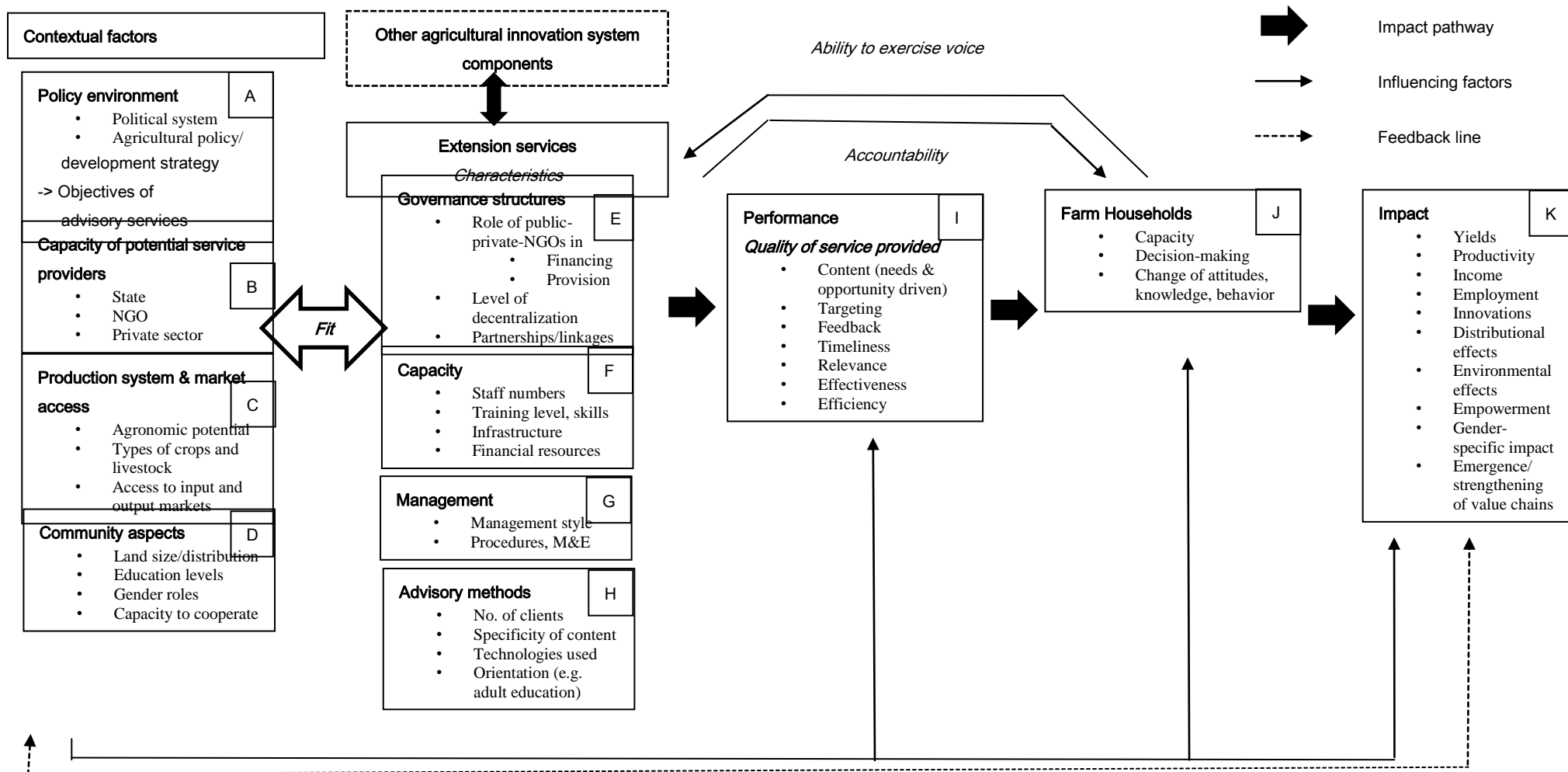


Figure 1: Framework for analysing advisory services

We now look at the extension characteristics affecting performance of advisory services, and thus impact. We examine in turn policy, governance, and capacity and management.

2.1 Policy Environment

Revitalising extension and advisory services was the focus of a landmark conference held in Nairobi in November 2011 (Pye-Smith, 2012), resulting in the Nairobi Declaration. One of the root causes of low productivity in Africa is the poor performance of the extension and advisory services, and the lack of financial support they receive (Pye-Smith, 2012 p. 5). It is therefore important to formulate national policies and strategies on extension and to ensure political and functional commitment (Qamar, 2005). Extension reform requires a policy vision and determination, as well as a nationwide strategy that can be effectively implemented (Rivera & Qamar, 2003). Policies and strategies much depend on government priorities and the needs of clientele. However, in formulating extension policy, and thus the roles of extension services and extension agents, it is important to note that today, for better or for worse, extension agents do more than just ‘traditional’ extension and technical agricultural outreach. They play a much bigger role, brokering and facilitating links and relationships within the agricultural innovation system, and thus require new strategies and capacities to perform these roles (Sulaiman & Davis, 2012). For policy-makers, extension is a much needed investment in human and social capital of the rural population of a nation. Specific attention must be given to:

- Prospects for regional and global platforms such as the African Forum for Agricultural Advisory Services (and their country forums) and the Global Forum for Rural Advisory Services
- Poverty alleviation, food security and risk reduction
- Gender equality in extension
- Rethinking priorities for pro-poor extension
- Market-orientation and demand drive
- Extension in research for development (Christoplos, 2010).

In an updated review of African extension policy, Idowu (2015) shows that from a list of 27 countries under review in, 13 countries have a legislated extension policy. The analysis showed that there is need to create awareness about the linkage that should exist between extension policy and Comprehensive Africa Agriculture Development Program (CAADP) pillars.

In RSA the National Extension and Advisory Service Policy (DAFF, March 2014) has been developed but is still in draft format and awaiting final approval. The policy aims to set a regulatory framework to guide the agriculture, forestry and fisheries sectors in the provision of extension and advisory services. The new policy will require a multidisciplinary approach for the capacity development of extension professionals with the relevant and diverse knowledge and tools. Thus policy-makers, extension managers, and training institutions must:

- Review and develop multidisciplinary training curricula for extension practitioners;
- Ensure continuous professional development through systematic maintenance, improvement and broadening of knowledge and skills; and
- Review academic curricula to develop well-trained extension professionals and contribute to the knowledge support system of government, offering accredited in-service training to extension practitioners.

One danger in developing extension policies is that they remain only on paper and are not implemented due to political change, lack of political will or lack of resources and capacity to do so. Part of the process of policy development is the development of an implementation framework and a monitoring and evaluation system to track and judge the policy's performance and impact.

2.2. Governance

Rivera, Qamar, and Van Crowder (FAO 2001) looked at options for institutional reform of extension in developing countries. The focus was on reform measures that promote food security and poverty alleviation among smallholder farmers. The reform initiatives were:

- a) Pluralism in advisory service provision
Pluralism of extension providers, involving coordinated partnerships with non-profit non-governmental organisations. Pluralism is much touted amongst development practitioners. Pye-Smith (2012, p. 11) stated that “there is a very strong argument in favour of creating a pluralistic system of delivery, which is participatory and demand-led”. Pluralism can be promoted in extension by involving public, private, and civil society institutions (Qamar, 2005). Pluralism in advisory services provides the opportunity to capitalise on the comparative advantages of different types of providers. However, coordination of such providers is challenging, particularly in ensuring that vulnerable sectors of the farming population have access to services and avoiding duplication of efforts (Christoplos, 2010, p. 6). The effective role of the private sector must be considered. In the future, more agricultural technology will be developed and sold by private-sector companies – thus the process of technology transfer will be increasingly privatised and handled by private firms. In developing countries the forming of public-private partnerships will reduce the need for so many government front-line public extension agents (Swanson, 2008). A pluralistic extension pattern demands that programmes/projects be jointly planned, implemented and evaluated by all service providers, in active collaboration with farmers (Rivera & Qamar, 2003). For pluralism to work, extension implementers, especially national extension services, must ensure effective operational linkages between extension and research and other key relevant institutions (Qamar, 2005).
- b) Participation and ensuring accountability to local clients (*decentralisation* to lower tiers of government).
There are increasing calls for ‘demand-driven’ and ‘farmer-led’ rural advisory services using participatory approaches (GFRAS, 2012). When promoting participation and accountability, it is important to think critically about who participates and who is accountable to whom. Policy-makers, planners and field-level programme staff can encourage bottom-up, grassroots extension programme planning by farmers to make extension demand-driven, but also exercise supply-driven, top-down modalities for promoting common public goods such as natural resource management or vaccination services (Qamar, 2005).

Decentralisation is taking place in more and more countries. Four types of administrative decentralisation include de-concentration, delegation, devolution and transfer to non-government institutions. Decentralisation, if well planned, can also increase accountability to rural people through subsidiarity – placing responsibility for activities at the frontline where extension services are closer to farmers (GFRAS,

2012). Accountability to rural people also means knowing whether a programme or organisational innovation actually worked or not and taking action to respond to challenges (GFRAS, 2012, p. 7).

Stakeholder participation in decision-making processes is crucial and requires collaboration, partnerships and coordination (Rivera & Qamar, 2003).

At the Nairobi conference, participants found that “...with greater coordination of extension, it will be easier to build synergies with research and education to provide the relevant knowledge base for transforming agriculture” (Pye-Smith, 2012, p. 9).

2.3 Capacity, Management and Organisation

Capacity, management and advisory service organisation are critical components of an effective extension system. But this very much depends upon the role extension is expected to play. According to Christoplos (2010), these roles include:

- Dissemination of information about technologies, new research, markets, input and financial services, and climate and weather.
- Training and advice to individual farmers, groups of farmers, farmer organisations, cooperatives and other agri-business along the market chain.
- Testing and practical adaptation of new technologies and practices on-farm.
- Development of business management skills among smallholder farmers and other local entrepreneurs.
- Facilitation of linkages among market actors.
- Linking smallholder farmers, rural entrepreneurs and other members of the agricultural community with institutions offering training and education in fields relevant to the agricultural sector.
- Facilitation of linkages between farmers, their organisations and the public sector.
- Increasing awareness of new opportunities for certification of ‘green’, fair trade and other production methods.
- Facilitating access to non-extension government support.

“In the past, when people talked about capacity development, they were largely referring to providing technical knowledge and information to farmers. Nowadays, the focus has begun to change, and at the conference we looked more broadly at capacity building using an ‘innovation systems perspective’ (Pye-Smith, 2012, p. 20). This assumes that the extension agents of the future – or the “new extension professionals” – will have a responsibility that goes beyond providing farmers with technical information. They will also require ‘soft’ or functional skills that enable them to generate and promote innovations; improve the management of farmer organisations and agribusinesses, and build alliances and networks of different groups and individuals along the value chain (Pye-Smith, 2012, p. 20). Human resources are a fundamental bottleneck to effective extension services, given the challenges facing rural development. Human resource development does not include just basic or pre-service education, but also continuing education, in-service and on-the-job training. Looking at the levels of capacity development, the new extensionist position paper (Sulaiman & Davis 2012, p. 8-9) summarises the following from the Nairobi conference:

- a) **Individual.** Effective advice is no longer a matter of simply providing messages about set technological packages but must include functional capacity to manage organisational and social processes.

- b) **Organisational.** Extension organisations need to be capable of managing innovation, coordination, alliance building, mediation, management and facilitation to deal with the complex agricultural challenges we face today.
- c) **System.** The overall agricultural knowledge and information system needs to change if extension is to operate effectively.
- d) **Capacities to manage change.** Resilience and risk management are critical competencies that must be developed at all levels (individual, organisational and system).

While capacity should focus at individual, organisational and system level (Sulaiman & Davis, 2012), human capital development is an essential ingredient of extension services as extension agents are the ‘front line’ of extension services (Rivera & Qamar, 2003). Both Romero (2012) and Sulaiman & Davis (2012) see rural extension as part of an innovation system. In their model of extension services embedded in an agricultural innovation system, Sulaiman & Davis (2012) lay out three levels at which capacity is needed in extension (individual, organisational and system). The capacities needed at individual level, from a global perspective, are listed in Table 1.

Table 1: Capacities required at the individual level globally

Technical	Functional
<p>Good understanding about appropriate/relevant/new technologies/practices/standards/regulations/policies in agriculture and natural resource management including:</p> <p>Technical options to support climate change</p> <p>Adaptation</p> <p>Agri-business</p> <p>Value chain development</p> <p>Improving resource use</p> <p>Efficiency; application of biotechnology</p> <p>Intellectual property and farmer rights</p> <p>Use of new information & ICTs</p>	<p>Community mobilisation</p> <p>Farmer organisational development</p> <p>Facilitation</p> <p>Coaching</p> <p>Reflective learning</p> <p>Mediating conflict</p> <p>Negotiating</p> <p>Brokering</p> <p>Networking and partnership development</p> <p>Leadership capacity</p> <p>Managing resources</p> <p>Critical thinking</p> <p>Problem-solving</p> <p>Self-reflection – learning from mistakes</p> <p>Service mindedness</p> <p>Accountability</p> <p>Responsibility</p> <p>Dedication/commitment</p> <p>Working in teams</p> <p>Working with women and gender sensitivity</p>

Source: Sulaiman and Davis 2012

To undertake these new duties and responsibilities outlined in Table 1, most extension staff members, especially those with diploma-level training, will need intensive in-service training and education (Swanson, 2008). The GFRAS Consortium on Extension Education and Training has taken up the New Extensionist concept outlined in Sulaiman & Davis (2012) to promote reform of extension education services. They call for the competencies indicated in Table 1 to be integrated into training curricula for extension agents (Davis, 2015).

The New Extensionist document calls for countries and regions to:

- Establish and strengthen training centres; contract in specific competencies required for supporting capacity development.
- Develop curricula for vocational and continuing education and skill up-gradation of individuals in extension and advisory services and undertake curriculum revisions at least once every five years (Sulaiman & Davis, 2012).

The GFRAS Consortium has further put together a set of “core competencies” (Table 2) that are required for extension agents around the globe to function effectively (Davis, 2015).

Table 2: Core Competencies for Extension and Advisory Services

Area	Competencies Required: Extension Professional Should be Able to...
Introduction to the new extensionist	Define the framework of agricultural innovation systems and position himself or herself within the innovation system Define his or her new roles and new capacities that are required for the new extensionist
Changing role of extension in innovation and development	Explain the role of extension in innovation and development Give an overview of approaches and tools Select appropriate approaches and tools for a given context
Extension programme management	Conduct extension programme planning, implementation, monitoring, and evaluation Use different types of problem solving techniques Build strategic partnerships, network, and manage stakeholders Pluralism in extension and the need for and methods of coordination and linkages
Professional ethics	Apply values and good principles such as honesty, respect, accountability inclusion, transparency, integrity Recognise extension as a science and extension as a profession
Adult learning and behaviour change	Practice adult learning design and implement adult learning programmes Initiate and support social networks for agricultural innovation
Communication for innovation	Communicate with all stakeholders in the agricultural innovation system Manage knowledge effectively Identify and use appropriate ICTs Identify cultural and gender implications in communication and innovation
Facilitation for development	Vision and organise demands Build local organisational capacities Broker and build linkages with actors in the innovation system

Area	Competencies Required: Extension Professional Should be Able to...
Community mobilisation	Conduct livelihoods assets assessment Use problem solving and decision making approaches Explain leadership principles and leadership development Explain implications of culture and diversity, including gender and youth Mobilise resources
Farmer institutional development	Explain or define theory, models, and types of groups and organisations Manage group dynamics Explain how the policy environment and “rules of the game” influence organisations
Value chain extension	Explain basic concepts and tools for value chain approaches Link farmers to market (input and output markets) Analyse consumer preferences Respond to standards certification and regulatory systems
Agricultural entrepreneurship	Analyse business opportunities and conduct market analysis Promote farm entrepreneurship
Gender and youth issues in agricultural extension and rural development	Appreciate gender differences through the following questions: who does what, with what, how and why? Use gender-sensitive approaches Engage and retain rural youth
Adaptation to change	Enhance adaptive capacities of communities to different types of risks and uncertainties related to climate change, markets and disasters Analyse tools for adaptation options Deal with risks, change, and uncertainties

Source: Davis (2015)

Extension agents cannot be expected to be experts in every technical and functional field. However, they should know how to broker information needed by their clientele. They also must be backed up by subject matter specialists. Other areas where extension agents may be called upon to work, depending on the local context, include:

- Food and nutrition security-related global developments that could eventually affect rural livelihoods (Qamar, 2005; Fanzo, Marshall, Dobermann, Wong, Merchan, Jaber, Souza, Verjee, & Davis, 2015).
- Forming and strengthening farmer groups (social capital) to gain economies of scale and to more efficiently supply markets (Swanson, 2008).
- Sustainable natural resource management, including water use management, soil and land use management and integrated pest management (Swanson, 2008).
- Climate change and other areas of risk.
- Linking and brokering relationships between scientific research, field-level innovations and innovators, markets, education and other services (GFRAS, 2012, p. 2).

- Promoting food production increase and reducing food losses to ensure food availability at reasonable prices (Christoplos, 2010).
- Encouraging the creation of more livelihood opportunities to reduce risk and earn income (Christoplos, 2010).

Finally, the issue of professionalism is a critical one. We need to give the extension profession a long overdue status similar to other agricultural disciplines (Qamar, 2005; Davis, 2015). This issue is covered in the following sections.

i. Capacity Needs in South Africa

A report on the profiles of government extension and advisory service officers (Directorate Education and Training, 2007) noted that about 80% of extension officers had a qualification of a diploma or lower. However, norms and standards requires a degree or higher. Technical skills of most extension officers in RSA include animal production, crop production, horticulture, business management, LandCare and mechanisation and irrigation (Directorate Education and Training, 2007). The report ended by recommending that the Directorate Education, Training and Extension Services should facilitate training in soft skills, possibly through a Frontline Extension Officers Development Programme and Extension Officers Management Development Programme. Similarly, the Agricultural Education and Training Strategy 2005 noted that there was a need for more practical skills in agriculture and improvement in marketing, farm and environmental management and value adding (Directorate Education and Training, 2005). At the time of publication the National Agricultural Education and Training Forum was launched, but disbanded around 2008.

In 2005 the Standard Generating Body (SGB) for Agricultural Extension, through a process of consultation and workshops, developed an Agricultural Extension Landscape. Terblanché (2008) discusses the outcomes. The landscape indicated specific extension concepts, study fields and essential skills and knowledge areas that every extension worker needs to successfully fulfil his/her task in a professional manner (Table 3).

Table 3: The Agricultural Extension Landscape in South Africa – Extension Concepts

EXTENSION CONCEPT	STUDY FIELD
Communication and interaction (The vehicle through which extension takes place)	Communication Group facilitation
Extension methodology (implementation and managing the extension process)	Approaches to extension Management in extension
Extension philosophy and practice (the science of extension)	Behaviour change Decision-making
Contextual Extension (the context or environment of extension Practicing)	Community development Extension policymaking

ii. Professionalising Extension Services

Along with qualifications come norms and standards. The Norms and Standards for Agricultural Extension and Advisory Services in South Africa (2005) document was a culmination of protracted discussions within the sector on the current status of

extension services in RSA, and a need to improve the system. The document covers the competencies and skills required in extension's human resources (p. 7-10):

A person employed as an agricultural extension advisor at all levels shall be required to have a minimum qualification of a bachelor's degree as well as a higher degree in extension and must register with the recognised relevant professional body.

Extension and advisory services in RSA therefore need a cadre of well-trained, dedicated and motivated staff skilled in agricultural production as well as functional extension and communication techniques. The provision of effective and on-going training is therefore in the long-term interest of the agricultural and advisory services. The training needs of extension officers must be continuously assessed and in-service training implemented accordingly.

The shortage of trained and experienced agricultural extensionists in South Africa has been the subject of much debate in recent years. The Department of Agriculture, Forestry and Fisheries (DAFF) has taken active steps to address the shortage of extensionists in the country through the development and roll-out of its Agricultural Extension Recovery Plan in all nine provinces. DAFF proposed that agricultural extension be formally recognised as a profession, governed by a legal framework and require formal registration and continuous professional development. DAFF requested the South African Society for Agricultural Extension (SASAE) to undertake a study on the feasibility of establishing a professional body for the registration of agricultural extensionists and advisors (Terblanché & Koch, 2012).

The study focused on the pros and cons of establishing a new professional council under the auspices of DAFF or pursuing registration under the South African Council for Natural Scientific Professions (SACNASP Determine the levels for professional registration.

According to Terblanché and Koch (2012) the purpose of the Natural Scientific Professions Act no 27 of 2003 was the establishment of the SACNASP and the registration of professional, candidate and certificated natural scientists.

According to Schedule 1 of the Act, no one may practice in any of the 21 listed fields of practice unless he/she is registered in a category of the schedule. The latest fields of practice published under Notice 36 of 2014 by the Minister of Science and Technology includes Extension Science as a field of practice. As to legality: only registered persons may practice in a consulting, extension/advisory capacity. The study suggested that agricultural and forestry consultants/advisors/extensionists can register under one or more of the following fields of practice:

- Agricultural Science;
- Animal Science;
- Soil Science; and/or
- Extension Science.

There are certain requirements for registration. For a Natural Scientist, it includes the following:

- The Professional Natural Scientist (Pr. Sci. Nat.) - 4yr BSc Agric degree or similar higher + 3yrs experience.

- A Candidate Natural Scientist (Cand. Sci. Nat.) - 4yr BSc Agric degree or similar higher + zero experience. 2 or 3 yr degree or diploma or equivalent qualification and between one and five years' experience.
- A Certificated Natural Scientist (Cert. Sci. Nat.) 2 or 3 year degree or diploma or equivalent qualification and between one and five years' experience.(SACNASP, 2014)

Table 4 indicates the registration categories for extension professionals.

Table 4: Extension Science Category Requirements for RSA

Category and Designation	Requirements
Professional Extension Scientist (Pr. Ext. Sci.)	Post graduate qualification in Extension; 120 extension credits on Honours degree level; Masters/PhD in Extension 5 years' work experience
Candidate Extension Scientist (Cand. Ext. Sci.)	4 year degree; 120 extension credits on Honours level Less than 5 years' work experience
Extension Technologist Level A (Ext. Tech. A)	Recognised extension qualification: 60-119 extension credits 5 years' work experience
Candidate Extension Technologist Level A (Cand. Ext. Tech. A.)	Recognised extension qualification: 60-119 extension credits Less than 5 years' work experience
Extension Technologist Level B (Ext. Tech. B)	Recognised extension qualification: 10-59 extension credits 5 years' work experience
Candidate Extension Technologist Level B (Cand. Ext. Tech. B)	Recognised extension qualification: 10-59 extension credits Less than 5 years' work experience
Associate Extension Technologist (Assoc. Ext. Tech.)	At least 10 years work, lacks appropriate training 2 credible independent witnesses

Source: www.SACNASP.org.za

The Act also calls for continuous professional development (CPD). Under, this, persons registered as professionals are required by their Code of Conduct to practice strictly within their area of competence and to maintain and enhance this competence. They therefore have the responsibility to keep abreast of developments and knowledge in their areas of expertise in order to maintain their competence. In addition to maintaining their own competence, they should strive to contribute to the advancement of the body of knowledge with which they practice, and to the profession in general. A committee has to be established to develop CPD for Professional Extensionists and the roll out of the process.

In this process of professionalization of the extension service in South Africa the SASAE as a recognised and registered Voluntary Association by SACNASP will play an essential role in future.

The process of professional registration of extensionists with SACNASP was launched in the second half of 2014. At the end of March 2016 SACNASP received 2,778 applications from the nine provinces.

2.4 Approaches

The approaches (tools or methods) used to fulfil extension functions depend on many things: the number of clients, the specificity of content, the technologies and the orientation of the services (such as adult education) (Birner et al., 2009).

Participatory and farmer-driven approaches are used for needs based development and include community participation and involvement (Düvel, 2003). Extension services often work through farmer groups, organising them into legal associations to constitute a strong lobby for themselves and for extension (Qamar, 2005). Thus it is important for extension to build social capital and help organise producers groups (Swanson, 2008). Local NGOs can be used to organise subsistence farmers into self-help groups/producer organisations and link them to an extension agents. According to Swanson (2008), rural youth programmes should be implemented to enable rural young people to learn leadership and off-farm jobs.

While many people promote information and communication technologies (ICT's) to get information out to farmers and reduce costs, they are not a replacement for extension staff or institutions (Rivera & Qamar, 2003). They are essential components of the development process and information technology tools and must facilitate the work of extension agents, as well as help to build their capacities.

2.5 The role of SASAE as a Voluntary Association

SACNASP registered SASAE with the support from DAFF to establish a CPD Committee to roll-out and implement the process of continuous development for extensionists in Extension as a Field of Practice and therefore as a Science. The Committee was established in December 2015 and are represented by the following stakeholders, SACNASP - three members, DAFF – three members and SASAE – four members. The Committee will specifically give attention to the following aspects:

- i) The Categories of activities for CPD credits namely:
 - Category 1: Development activities
 - Category 2: Work based activities
 - Natural Scientific work
 - Extension Scientific work
 - Mentoring of candidate practitioners
 - Category 3: Individual activities

The final credits within the three Categories will finally be approved by The SASAE and SACNASP (SACNASP, 2015).

- ii) The role of SASAE as a Voluntary Association:
 - Assist their members in identifying CPD activities which meet their needs;
 - Present CPD activities as described in Category 1; and
 - Validation and monitoring courses, seminars and conferences for CPD credits by other providers.

- iii) SASAE will be responsible for issuing specific certificates indicating the level of professional registration in the Science of Extension. It is however a prerequisite that the applicant must be a member of SASAE.
- iv) SASAE need to investigate to register as a training provider, presenting skills programs in the Science of Extension to members and non-members.
- v) SASAE will be responsible to issue certificates of attending the conference, presenting a scientific paper/ popular paper/and or a poster, and a certificate to the presenter of the best scientific paper.
- vi) SASAE need to get AGM approval to change the current membership categories in the Constitution to be aligned with the professional categories as indicated in Table 4.

3. SUMMARY AND CONCLUSION

This paper has summarised a review of literature on extension and advisory services in South Africa and internationally. Using the “best-fit” framework (Birner et al., 2009), the authors examined the policy environment, governance structures, capacity and management, and extension approaches.

As discussed in the Nairobi conference (Pye-Smith, 2012), the most successful extension approaches achieve the following: empower farmers and communities; take into account local culture and tradition; and frequently target specific groups such as women and young people. The best approaches tend to be participatory and demand-led; in other words, they respond to the individual needs of farmers and communities

Knowledge sharing is critical to supporting social, economic and environmental development, and extension and advisory services are a vital knowledge-sharing institution. According to GFRAS (2012), there are five opportunities to mobilise the potential of extension and advisory services (p 2):

- i. Focusing on best-fit approaches;
- ii. Embracing pluralism;
- iii. Using participatory approaches;
- iv. Developing capacity; and
- v. Ensuring long-term institutional support.

We therefore give the following policy recommendations for national policy-makers and decision-makers in agricultural extension and advisory services and education:

- i. Higher education institutions must ensure that the qualifications in agriculture and in extension are in line with the SACNASP registration requirements.
- ii. Higher education institutions should consider a postgraduate degree in extension for those who already have a technical degree but require further competencies in extension.
- iii. Higher education institutions must clearly indicate to students the level of professional registration of each qualification.
- iv. Higher education institutions and other trainers should provide functional skills for all those working in the agriculture sector, not just extension.
- v. Higher education institutions and other trainers should reskill existing workers with functional and technical competencies to meet the challenges in RSA today.
- vi. Employers of agricultural extensionists and advisors should make sure that employees can register with SACNASP.

- vii. Employers advertising a vacancy must clearly indicate on what level of professional registration with SACNASP the employee must be registered to be able to apply for the vacancy.
- viii. Policy-makers and employers should enhance the attractiveness of the profession through adequate salaries, incentives and awards and other types of recognition.
- ix. Policy-makers and research institutes should promote a vibrant culture of research to attract funding, students and quality human resources to extension.
- x. Higher education institutions and extension research must engage with industry through seminars, tracer studies, and needs assessments to ensure they are producing graduates with relevant competencies and relevant research results.
- xi. The role of SASAE as a Voluntary Association:
 - To undertake an in-depth study to determine what the extension landscape currently look like and what is needed for the next 10 years;
 - To establish a CPD Committee that will continuously determine what is needed for extensionists to improve their skills and knowledge;
 - To establish an Education and Learning Committee who needs to evaluate extension qualifications and skills programs that will ensure extensionists to improve their skills and knowledge.

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EFFECT OF USAID MARKET IMPROVED PRACTICES ON RICE FARMERS IN KWARA STATE, NIGERIA.

Oladipo, F. O.,¹¹ Bolarin, O.,¹¹ Daudu, A. K.,¹¹ Olatinwo, L. K.¹² & Ajibade, O.¹¹

Correspondence Author: A K Daudu Email: kamal_4real@yahoo.com, +2348032853580

ABSTRACT

This study examined the significance of USAID/Markets rice intervention programme on rice farmers' productivity in Kwara State, Nigeria. A two-stage sampling technique was employed in selecting 240 (120 network farmers and 120 non-network farmers) rice farmers drawn from the study area. Data collected were analysed using frequency counts, percentages and charts while correlation was used to make deduction from the study. The findings revealed that majority (48.8% and 33.6%) of male and female fell between 46-65 age brackets. Activities such as land preparation, selection and planting of cultivars, were the common activities among male respondents while harvesting, processing and marketing were the activities common to female respondents with male involving more in all the activities. Insufficient fund (65% and 52%), pest and disease attack (63% and 65%), high cost of input (56% and 59%) were some of the highest constraints to arable crop production common to both male and female respondents. Results of correlation analysis revealed that there were significant relationship between male and female respondents and their level of involvement in arable crop production activities and age ($r=0.545$), education ($r=0.432$), farming experience ($r=0.653$) at $P \geq 0.05$ level of significance. The study concluded that male were more involved in arable crop production activities than their female counterpart in the study area. The study therefore recommended that government should design gender policies that could strike the balance between male and female farmers with a view to encouraging more women to participate in arable crop production activities in the state.

Key words: Rice, Effect, USAID/Markets project, Intervention, Programme

1. INTRODUCTION

Rice is one of the major staples, whose production if encouraged can provide the population with the nationally required food security minimum of 2400 calories per person per day (FAO, 2000). The crop is commonly consumed even as a food crop for household food security. The average Nigerian consumes about 24.8 kg of rice annually, representing 9 per cent of the total annual calories intake and 23 per cent of total annual cereal consumption. Since the mid-1980s, rice consumption has increased at an average annual rate of 11 per cent of which only 3 per cent can be explained by population growth. The remainder represents a shift in diet towards rice at the expense of the coarse grains (Millet and Sorghum) and wheat. Nigeria's demand for rice is roughly four million tonnes annually. Due to its increasing contribution to per capita calorie consumption of Nigerians, the demand for rice has been increasing at a much faster rate than domestic production and more than in any other African countries since mid-1970s (FAO, 2001). For instance, during the 1960s, Nigeria had the lowest per capita annual consumption of rice in the West African sub-region with an annual

¹¹ Department of Agricultural Extension and Rural Development, University Of Ilorin, Ilorin, Nigeria. Email: kamal_4real@yahoo.com, +2348032853580

¹² Department of Agricultural Economics and Extension, Federal University, Dutsin-Ma, Katsina State, Nigeria

average of 3kg. Since then, Nigeria's per capita consumption levels have grown significantly at 7.3 per cent per annum.

Over the years, investments into the rice agricultural sub-sector include the establishment of a Rice Station at Badegi, Niger State in the 1950s. The rice station was later renamed the National Cereal Research Institute (NCRI) for the development of improved rice and other cereal varieties. Other programmes that were to augment the functions of the Research Station were the Kwara Agricultural Development Programmes in collaboration with other bodies such as Olam Nigeria Limited, USAID and First Bank of Nigeria in Kwara State, Nigeria organized to increase the capacities of rice farmers and this covers rice agronomy, management, processing (which is value addition) and marketing.

Statistics from the European Association of Agricultural Economics, EAAE indicates that Nigeria's by far the largest rice importer in West Africa, with an average yearly import of over 2 million metric tons since the year 2000 (USAID/Markets). Total consumption stands at 4.4 million metric tons of milled rice while annual consumption per capita stands at 29kg and this has continued to rise at 11% per annum, induced by income growth. However, Nigeria produces only about 2.8 million metric tons with a deficit of about 2 million tons, excluding the huge quantity smuggled through the porous borders. Presently, Nigeria's rice sub-sector is dominated by weak and inefficient producer-market linkages due to lack of production, technical know-how, poor infrastructure including lack of improved processing facilities, low rice productivity, poor post-harvest handling and storage, expensive and poor access to inputs (high quality seed, fertilizer, and crop protection products (USAID/MARKETS)

Although rice production has increased during the last two decades in Nigeria, the country's production capacity is far below the national requirement. Nigeria's inability to meet her rice consumption needs through local production has resulted in high cash outlays for importation. Meanwhile, Fashola *et al.*, (2001) reported that training of farmers for development is one of the numerous activities that need to be carried out to sustain production of food and to enhance self-sufficiency in food production in the developing world. He also added that training is mostly directed at improving the ability of individuals to make their vocation more effectively and efficiently and that it involves acquiring information and developing abilities or attitudes, which will result in greater competence in the performance of a work. Farmers have been producing crops since ages by inheriting the production technologies from their ancestors and these olden day technologies cannot meet up with the demand of the present. USAID/Markets are endeavouring to develop new technologies that will increase the production and productivity of various crops at the farm level. The USAID/Markets aims at helping the rice farmers in the area of integration & socialization, adoption of new technology, improve family welfare, increase productivity; Expectedly, rice productivity in USAID/Markets areas, ought to have been on increase and thus to cause improved productivity for the farmers as well as improving their standard of living. It is on this premise that this study sets out to examine the significance of USAID/MARKETS rice intervention programme on rice farmers' productivity in Kwara state, Nigeria. Specifically it identified the technologies brought by USAID/Markets intervention programme to the rice farmers and assessed the effect of USAID/Markets intervention on rice farmer's productivity in the study area.

2. METHODOLOGY

This study was conducted in Kwara State, Nigeria. Kwara State is located in the North-Central geographical zone of Nigeria within latitudes $7^{\circ} 45'N$ and $9^{\circ} 30'N$ and longitudes $2^{\circ} 30'E$ and $6^{\circ} 25'E$. It covers a total land area of about 36,825 square kilometres. It shares boundary with Ekiti, Oyo, Osun, Niger and Kogi States in Nigeria and an international border with the republic of Benin along its north-western part. The main ethnic groups in the state are Yoruba, Hausa, Fulani and Nupe (Kwara State Ministry of Information, 2002). The State has two main climatic seasons: the dry and wet seasons. The wet season falls between April-October while the dry season runs between November-March of each year. The annual rainfall range from 1000-1500mm while maximum average temperature ranges between $30^{\circ}C$ and $35^{\circ}C$, the natural vegetation consists broadly of rain forest and wooded savannah while the land forms consist of undulating hills, valleys and plains which are transverse by the River Niger and its tributaries. These two structural components favours the cultivation of upland and swamp rice, respectively.

A two-stage sampling procedure was employed in the selection of respondents. The first stage involved selection of two major rice producing zones (B & D) from the four Kwara State Agricultural Development (KWADP) zones in Kwara State. The second stage involved a random selection of ten villages from zone B with a total number of 180 rice farmers for both networked & none networked farmers and five villages from Zone D with total number of 60 rice farmers for both categories. At the end of the exercise total number of the respondents was 240 rice farmers with the composition of 120 per category (network & none network rice farmers). Data obtained were described with descriptive statistics such as frequencies, percentages and charts were used to explain the data while inferential statistics involving correlation was employed to test the hypothesis.

3. RESULTS & DISCUSSION

3.1 Socio-economic characteristics of the respondents

3.1.1 *Age of the respondents*

Figure 1 showed that the mean age of network farmers was 50.8 with the standard deviation of 8.4 and None-network Farmers was 51.3 with the standard deviation of 8.0. The mean age of both respondents fallen between 50 - 59years. It was revealed that the network farmers (40.0%) and non – network farmers (42.5%) were within the age range of 40 - 49 years and 50 - 59 years respectively. The findings show that the beneficiaries of the USAID/Markets program were more of youths and younger in age than the non – network farmers.

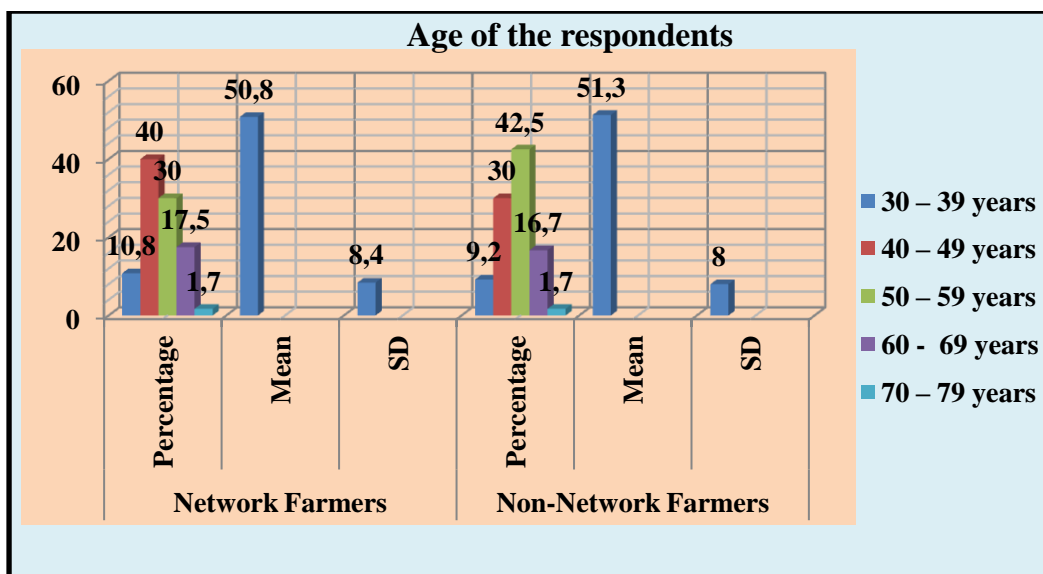


Figure 1: Distribution of respondents according to their age
Source: Field survey, 2015

3.1.2 Marital Status

Results in figure 2 revealed that 98.3% of the network farmers were married and 1.7% were widowed while 91.6% and 8.33% of the non – network farmers were married and widowed respectively. Marital status is a variable tool that determines an individual’s resolve to demonstrate or show a mark of social responsibility and sometimes indicate a complementary source of labour input.

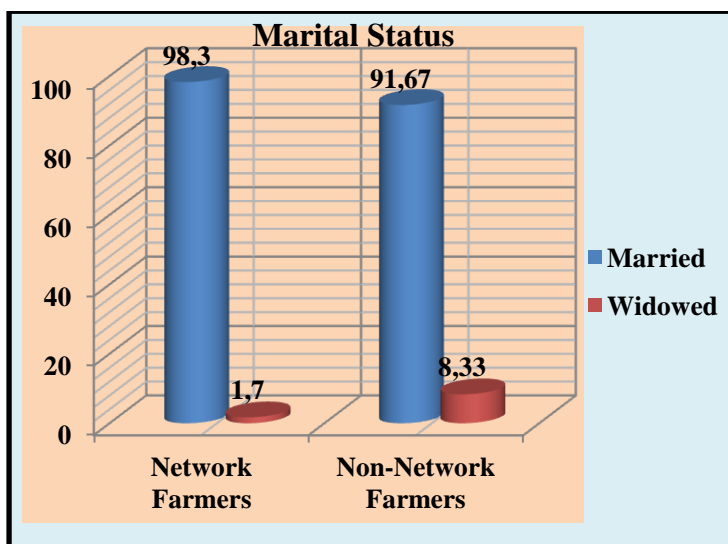


Figure 2: Distribution of respondents according to their marital status
Source: Field survey, 2015

3.1.3 Educational Level

Figure 3 revealed that 65.0% of the network farmers had primary education while 63.3% of the non - network farmers also had primary education. This result shows that the respondents have one level of education or the other. This may not be unconnected with the fact that education plays a very prominent role among farmers as supported by the finding of Amaza

& Tashikalma (2003), who reported that education offers the opportunities to earn better and could impact significant variation in skills acquisition and adoption of new ideas.

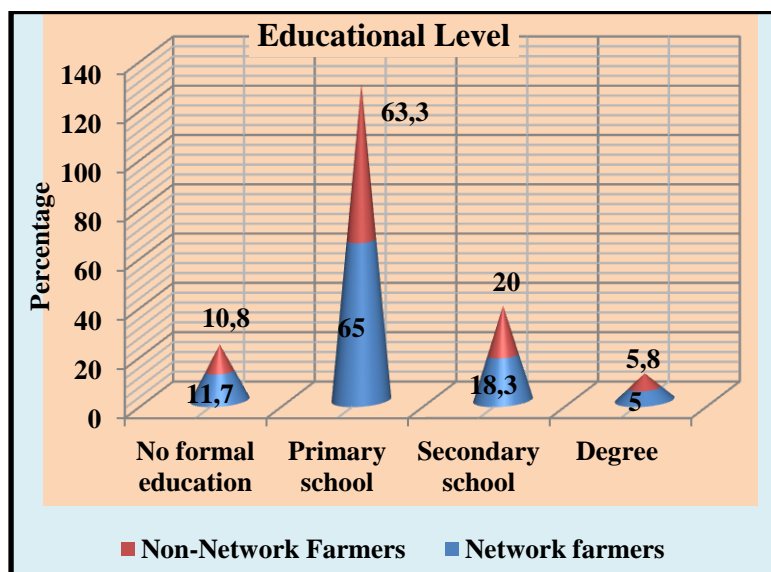


Figure 3: Distribution of respondents according to educational level
Source: Field survey, 2015

3.1.4 Gender Distribution of the Respondents

Results in figure 4 revealed that 72.5% of the network farmers are males while 27.5% are of the female gender. Also, in the gender distribution of the non – network farmers 75% and 25% were male and female respectively. The gender distributions of the respondents in the study showed that majority (72.5%) network and (75%) non - network farmers were males. This might be because farming activities is energy consuming and the male are capable of doing more tedious work than the females, NBS (2012).

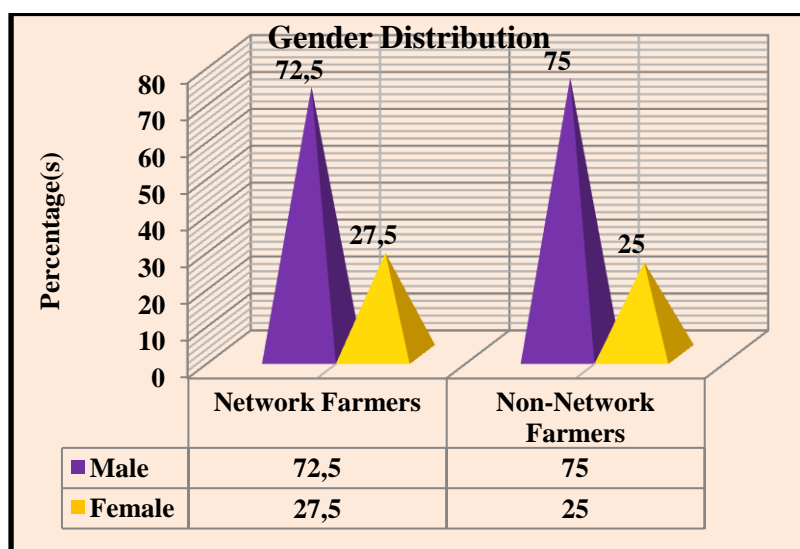


Figure 4: Distribution of respondents according to educational level
Source: Field survey, 2015

3.1.5 Farming Experience

As shown in Fig. 5 60.8% of the network farmers had 5 – 10 year farming experience while 38.3% of the non - network farmers had 11 – 15year farming experience. The result indicated that respondents generally were well experienced in the farming business. It is expected that the longer they stay in farming, the better the result of their farming activities provided the vital inputs are available.

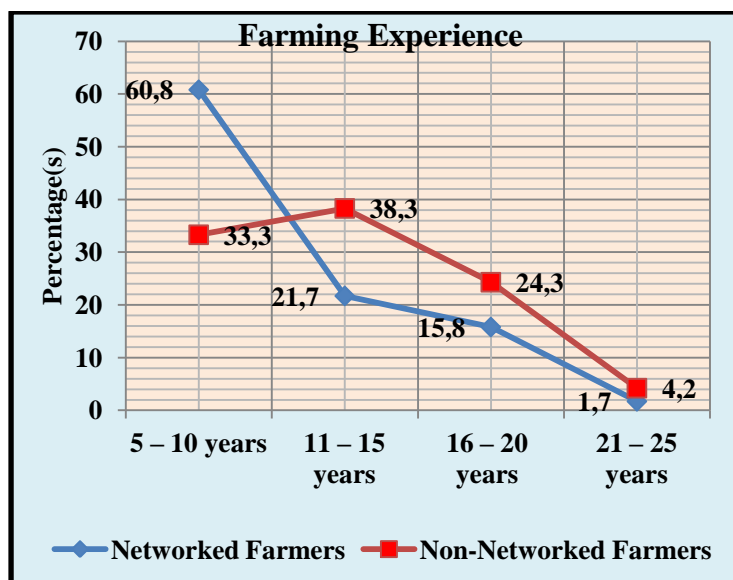


Figure 5: Distribution of respondents according to farming experience
Source: Field survey, 2015

3.2 Network Farmers' Farm size

Figure 6, revealed that before the USAID/Markets intervention programme farmers cultivated between 0 – 2 ha of farm land and the majority of the farmers (98.3%) cultivated 1ha of farmer. At the advent of the USAID/Markets intervention programme farmers farmland expanded and they cultivated between 1 – 2.5 ha of farm land. Although the farmers were still small scale but this is in line with the assertion of Olujide (1999) who posited that importance of small scale farmers can be premised on certain basic bench marks. First, they are very efficient in the utilization of the basic productive resources available, make important and significant contributions to national product and still remain the main producer of more than 98 percent of the food consumed in Nigeria, with only exception of wheat.

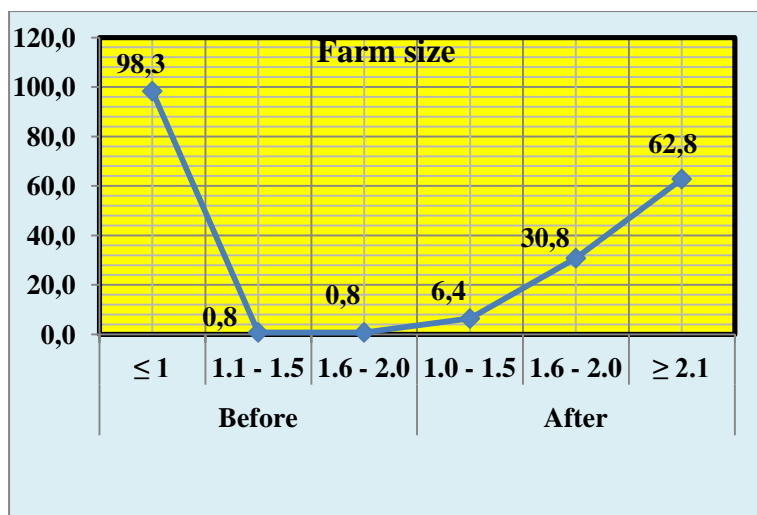


Figure 6: Network farmers' Farm size before and after USAID/MARKETS intervention programme

Source: Field survey, 2015

3.3 Non-network farmers' Farm size before and after the advent of USAID/Markets intervention programme.

Results in figure 7 shows that majority of the non – network farmers cultivated 1ha of land before the programme and 84% of these farmers were able to increase their farm size to 1.5ha after on. When this is compared to the farm land cultivated by the network farmers, it is glaring that they were able to expand their cultivation to 2.5ha of farm land at the advent of USAID/MARKETS intervention programme.

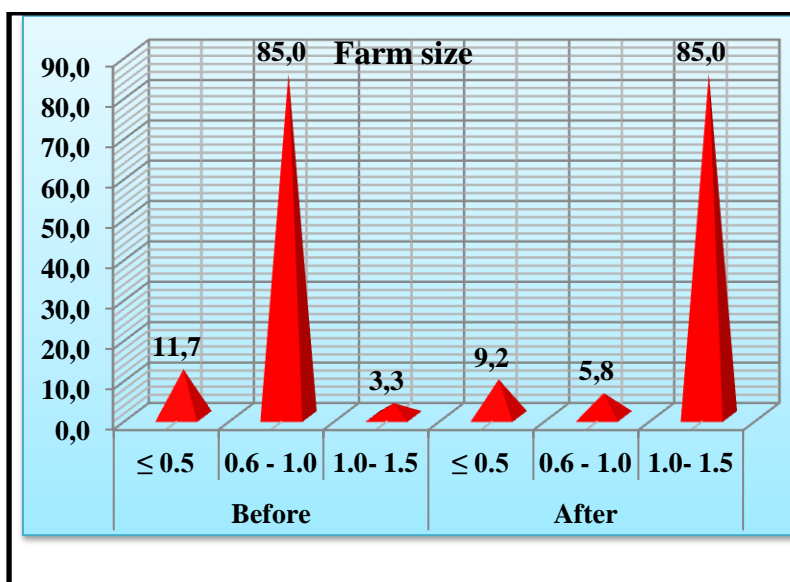


Figure 7: Non-Network farmers' Farm size before and after USAID/MARKETS intervention programme

Source: Field survey, 2015

3.4 Network Farmers Output before and after USAID/MARKETS intervention programme

Results in Figure 8 revealed that before the USAID/Markets intervention programme, 31 – 40 bags of rice were produced by the majority (56.7%) of networked farmers but after the USAID/Markets intervention programme the majority (60.8%) networked farmers had an increase in production ranging between 41 – 50 bags of rice.

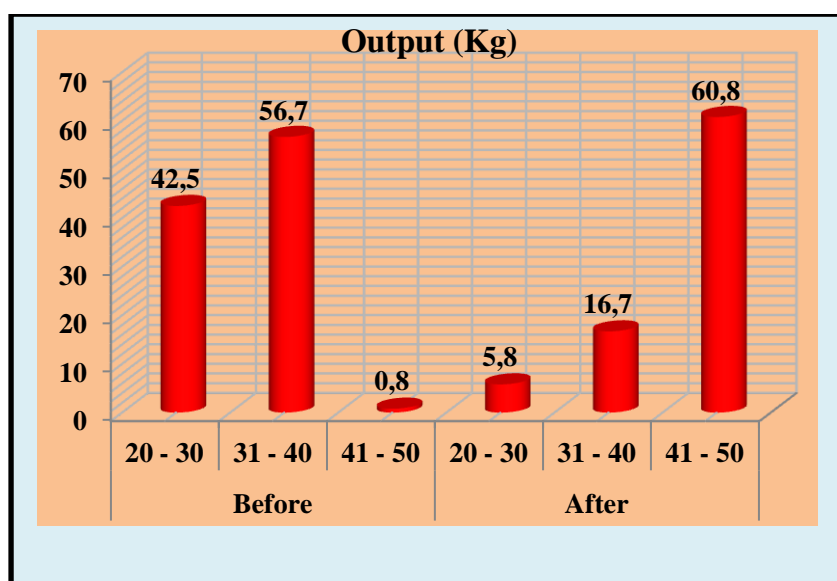


Figure 8: Network farmers' Output before and after USAID/MARKETS intervention programme

Source: Field survey, 2015

3.5 Farm output of the non-network farmers before and after the advent of USAID/Markets intervention programme.

As indicated in figure 9, 55% of the non – network farmers produced 31 -40bags of rice some years ago and over the years, 51% of the non – network farmers produced 20 -30bags of rice. This implies that there is a reduction in the quantity of rice produced by the farmers and could be associated to the continual depreciation of the soil fertility and the ignorance of the non –network farmer to adopt improved seed varieties and new agricultural technologies.

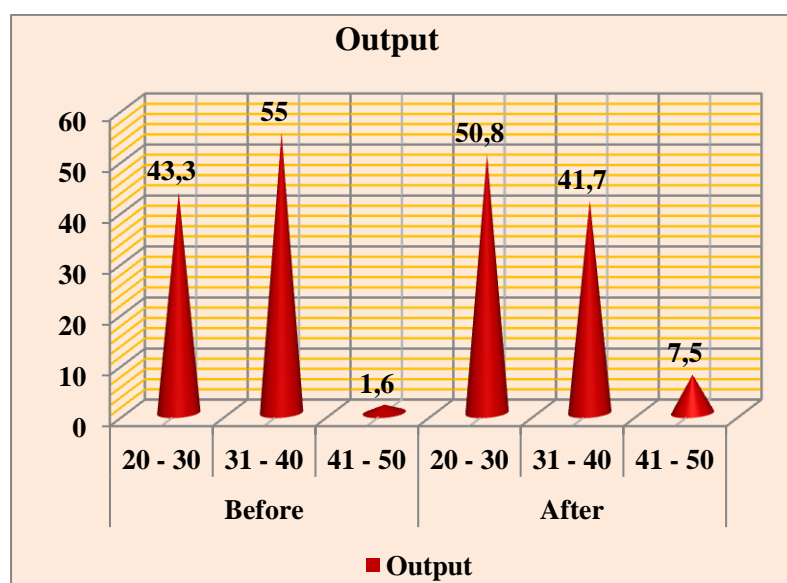


Figure 9: Non-Network farmers' Output before and after USAID/MARKETS intervention programme
Source: Field survey, 2015

3.6 Farm income of the network farmers before and after USAID/Markets intervention programme

Figure 10 shows that before the USAID/Markets intervention programme 39.2% of the farmers realize a total sum of money ranging from ₦ 20,000 – ₦30, 000 but after being one of the partakers of the USAID/Markets intervention programme, the net-worth of majority of the farmers shoot up to the range of ₦ 50,000 – ₦100,000 while some of them were still able to realize a revenue ranging between ₦ 100,000 – ₦150,000 from the sales of their produces.

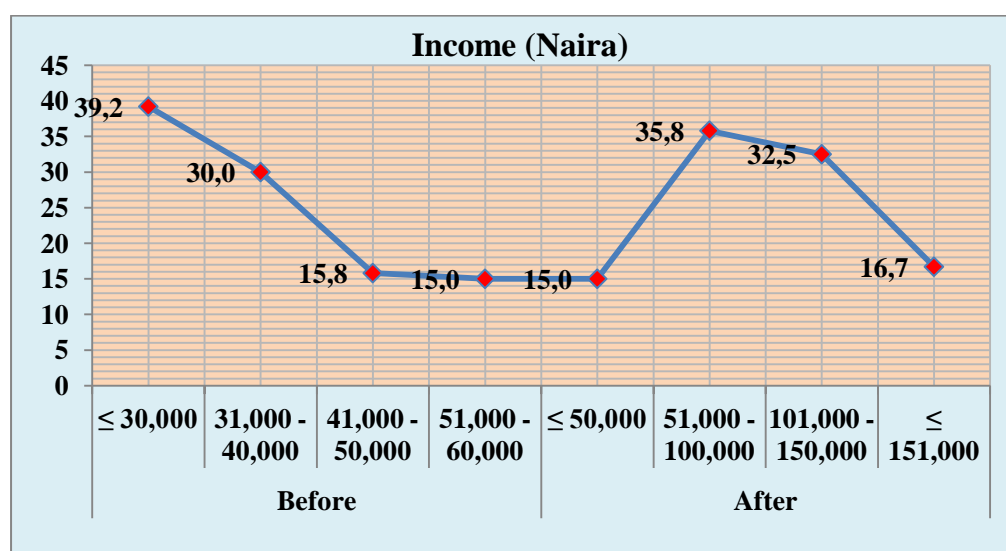


Figure 10: Network farmers' Income before and after USAID/MARKETS intervention programme
Source: Field survey, 2015

3.7 Non-network farmers' Income before and after the advent of USAID/Markets intervention programme

The result from figure 11 shows that majority of the non – network farmers realize a total sum of money ranging from ₦ 20,000 – ₦30,000 before the programme intervention and over the years, 50% of the farmers had a net worth ranging between ₦ 31,000 – ₦40,000. This income is not on the high side when compared to the net worth of the network farmers.

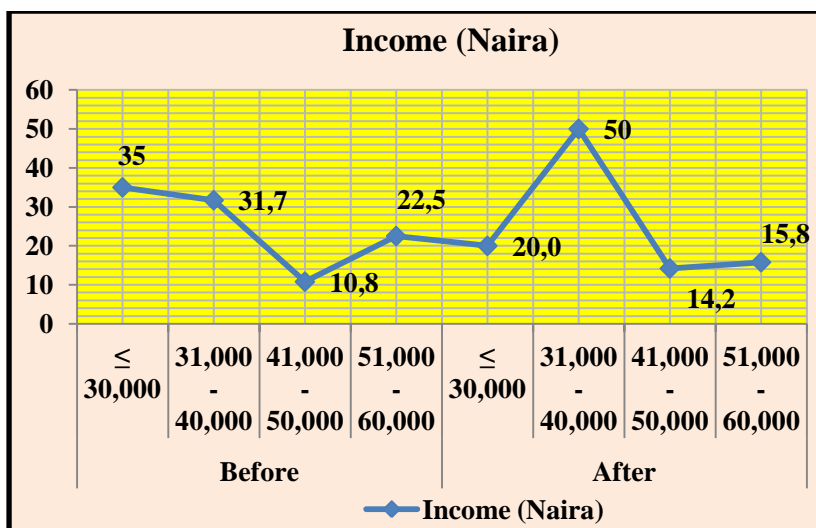


Figure 11. Non-Network farmers' Income before and after USAID/MARKETS intervention programme

Source: Field survey, 2015

3.8 Knowledge level of Network Farmers

As revealed in figure 12, after the USAID/MARKETS intervention programme the percentage of farmers who had knowledge on new technology increased significantly compared to before the USAID/MARKETS intervention programme.

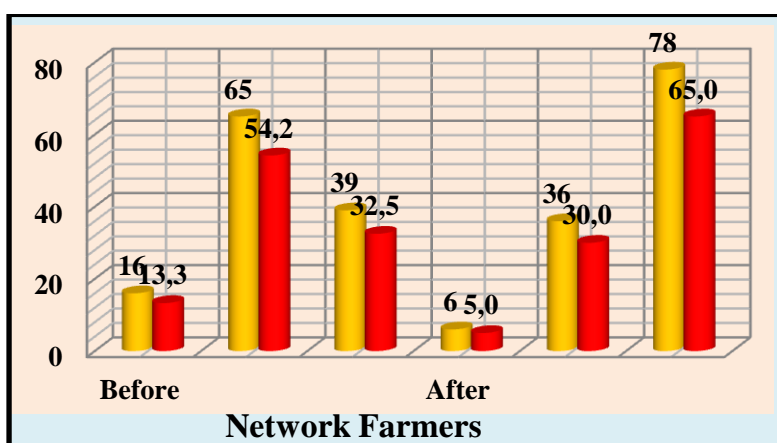


Figure 12: Network farmers' knowledge on new technology before and after USAID/MARKETS intervention programme

Source: Field survey, 2015

3.9 Non-network farmers' knowledge on new technology before and after the USAID/Markets intervention programme

The result in figure 13 showed that before the USAID/Markets programme 49% of the non – network farmers had knowledge on new technology and over the years their percentage remained the same. This suggested that the farmers still ply on the old technological knowledge they acquired in years past.

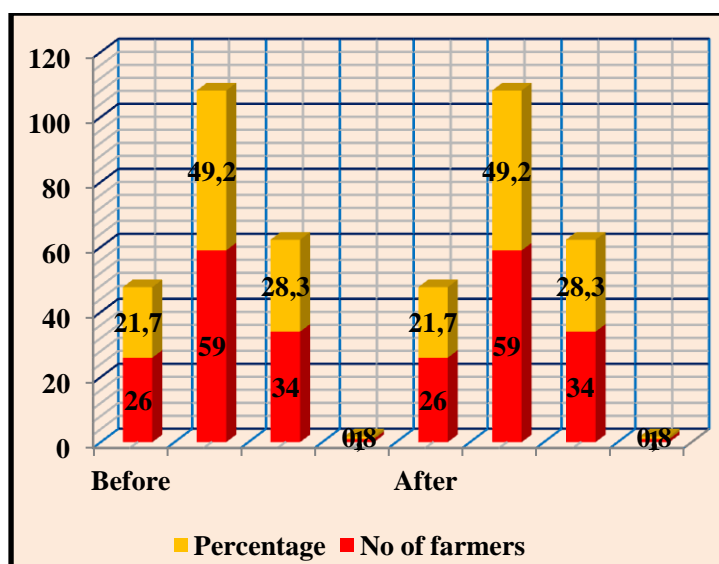


Figure 13: Non-network farmers' knowledge on new technology before and after USAID/MARKETS intervention programme

Source: Field survey, 2015

3.10 Incentives in terms of training and technologies brought by USAID/Markets on rice intervention programme to improve the life of the network farmers

A ranking technique was used to identify among various pre-determined incentives in form of training the organization (USAID/Markets) gives to farmers so as to know which one is delivered in term of respondents' perception. The perception of the respondents pertaining to these incentives is shown in the table 1 with respect to the benchmark of the overall average mean rating of the response i.e. 4.12, out of 13 pre-determined incentives designed presumably to be given to the farmers by the (USAID/Markets) programme, 7 were found to be greater than the overall average mean thus these were the incentives delivered to the network farmers by the (USAID/markets) programme. The incentives delivered to the network farmers by the (USAID/MARKETs) programme include: group formation to enhance loan and grant accessibility, fertilizer and agrochemical sourcing, sourcing improved seed/seedling, improved storage mechanism, skill development and dissemination of general information on soil fertility/conservation technology. Other incentives delivered to the network farmers by the (USAID/MARKETs) programme aside these were also delivered but priority was given to the aforementioned incentives.

Table 1: Types of incentives in terms of training and technologies brought by USAID/Markets on rice intervention programme to improve the life of the network farmers

Extension service Delivery	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree	Mean (53.62)	Remark
Group formation to enhance loan and grant accessibility	60	60	0	0	0	4.5	Delivered
Fertilizer Sourcing	44	54	22	0	0	4.18	Delivered
Training and Education on Agro-technology	48	53	9	4	6	4.11	
Agro Chemical Sourcing	55	54	7	2	2	4.32	Delivered
Sourcing Improved seed/Seedling	58	55	4	1	2	4.37	Delivered
Agro innovation Sourcing/Dissemination	41	52	20	5	2	4.04	
Improved storage mechanism	53	56	6	3	2	4.29	Delivered
Post harvesting & Marketing linkages	46	54	8	4	8	4.05	
Skill development	45	53	15	6	1	4.13	Delivered
Farm Record Keeping	36	57	25	2		4.06	
Management of water project and forestation	34	54	19	3	0	3.74	
Dissemination of general information Soil fertility/conservation technology	40	48	20	6	6	4.32	Delivered
Farming system improvement technology	33	35	28	9	15	13.52	

Overall average mean = 4.12;

Source: Field survey (2015)

3.11 Achievements of the network farmers as a result of the USAID/MARKETS intervention programme

Achievement in this study refers to the benefits regarded as tangible and intangible acquisitions as a result of the extension programme the respondents went through. Table 2

above presents the achievements resulting from the involvement of the network farmers in the USAID/MARKETS intervention programme as mentioned by them. As shown in the table, the major significant achievement among the network farmers were farm expansion, increased of farm production, acquisition of farmland, increased number of crop produced, improved family welfare, children education, renovated old house, purchased motor cycle, adoption of more farm technology, increased in farm income and skills acquisition.

Table 2: Result of the achievements of the network farmers as a result of the USAID/MARKETS intervention programme

Achievements of USAID/Markets	Mean	Remark
Farm expansion	4.475	Achieved
Increased of farm production	4.467	Achieved
Acquisition of farmland	4.30	Achieved
Increased number of crop produced	4.316	Achieved
Corn mill/cassava grater	2.016	Not achieved
Purchased tractor	2.56	Not achieved
Improved family welfare	4.483	Achieved
Children education	4.467	Achieved
Renovated old house	3.808	Achieved
New House	2.791	Not achieved
Purchased motor cycle	3.751	Achieved
Adoption of more farm technology	4.33	Achieved
Motor vehicle	2.45	Not achieved
Increased in farm income	4.425	Achieved
Skills acquisition	4.03	Achieved

Source: Field survey, 2015

Table 3: Results of the relationship between some selected personal characteristics of rice farmers and type of incentives in terms of training the organization (USAID/MARKETs) give to farmers in the study area.

Variable	r-value	p-value	Decision
Age	0.038	0.687	Not Significant
Education	0.0270**	0.0003	Significant
Experience	0.057	0.535	Not Significant

Source: Field Survey, 2015

** Correlation is significant at 0.01 level (2-tailed)

Results in Table 3, revealed that only education was positive and significant at 0.01 level of significance ($r=0.0270$, $p=0.0003$). Thus, the null hypothesis is rejected and the implication of this result is that as level of education of networked farmers increases the knowledge level of farmers and their assimilation would also increases. While age ($r= 0.038$, $p=0.687$) and experience ($r=0.057$, $p=0.535$) were not significant and this shows that they have no effect on the type of incentives in terms of training the organization (USAID/MARKETs) give to farmers in the study area.

4. CONCLUSION

It can be inferred from this study that farming activities among farmers are carried out mainly by the male folks. The study also revealed that majority of the network farmers in the study

area were married and that they had at least primary school education which offers them the opportunities to acquire diverse skills, adopt new ideas and earn reasonable income from their farm productions. Result from the ranking showed that out of 13 pre-determined incentives designed presumably to be given to the farmers by the (USAID/Markets) programme, 7 were found to be greater than the overall average mean thus these were the incentives delivered to the network farmers by the (USAID/Markets) programme. Also, the result showed that the attitudes of farmers towards the USAID/MARKET rice intervention programmes has positive effect on the networked farmers in terms of increase in farm size (ha), yield(kg), income(#), welfare condition and adoption of new technologies. It's therefore recommended that effort should be made by government to provide infrastructure such as good road, communication network to enhance the effort of USAID/Markets extension providers and also make the environment more conducive in terms of policies, strengthening security, and taxes to encourage more NGOs (both local and international) for intervention programmes.

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EFFECT OF AGRICULTURAL TRANSFORMATION AGENDA POLICIES ON CASSAVA PRODUCTION AND PROCESSING AMONG RURAL WOMEN OF RIVERS STATE, NIGERIA.

Abali, I.,¹³ Nnodim, A. U.,¹⁴ Isirimah, C. B.,¹³ Ogunu, E. U. G.¹³ & Emerhirhi, E.¹³

Correspondence Author: I Abali. E-mail: abaliinnocent@gmail.com

ABSTRACT

The Agricultural Transformation Agenda (ATA) of the immediate past administration of Federal Government of Nigeria is an agricultural policy directive whose aim is to diversify the economy from reliance on oil, assured food security and create jobs, especially for the teeming youths and rural women. Thus, the study was on the effect of Agricultural Transformation Agenda (ATA) policies on cassava production and processing among rural women of Rivers State. The Specific objectives of the study include to: examine the socio-economic characteristics of the respondents, ascertain the level of awareness of cassava-base farmers of the ATA policies of government, determine the effect of ATA policies among rural women participation in cassava production and processing and determine constraining factors facing the rural women in the ATA policies in cassava production and processing in the study area. A total of one hundred and sixty respondents were selected for the study using purposive and multi-stage sampling technique. Primary and secondary data were used to elicit information necessary for the study. The primary data for the study were obtained using a structured questionnaire and responses recorded from the respondents during focus group discussion. Data were analyzed using descriptive and inferential statistics. The study revealed that 80 per cent of the respondents had no formal education. Marital status, educational attainment, religion, occupation, and income status of the respondents were not considered as determinant factors of ATA policies in rural women participation in cassava production and processing (χ^2 - value = 131.638, $p > 0.05$). The study further revealed that ATA policies had a very little effect on women participation in cassava production and processing. Major constraints the rural women faced in cassava production and processing under ATA included, poor extension services (Mean=3.04), bureaucratic bottle-neck of government (Mean=3.02), cultural practices on land ownership (Mean=3.00), and lack of information on ATA policies (Mean=2.95). It was therefore concluded that ATA policies of the immediate past administration of Federal Government of Nigeria affected the rural women in cassava production and processing to a very little extent. The extension implication of this study is for government at all levels to synergize with extension administrators to put in place appropriate extension services on benefits of ATA to rural women at the grass root level and remove bureaucratic processes that hinder rural women from effective accessibility of ATA policies and its benefits. This will create room for effective information delivery and the propensity of rural women participation in agricultural development programmes.

KEY WORDS: Agricultural, Transformation, Agenda, Rural, Women, Cassava

1, INTRODUCTION

¹³ Department of Agricultural Education. Federal College of Education (Technical), Omoku in affiliation with University of Nigeria, Nsukka, Nigeria.

¹⁴ ²Department of Technical and Science Education, Rivers State University of Science and Technology, Rivers State. Phone: +234(0)8068837052

The Agricultural Transformation Agenda (ATA) of the immediate past administration of Federal Government of Nigeria is an agricultural policy directive whose aim is to diversify the economy from reliance on oil, assured food security and create jobs, especially for the teeming youths. Specifically, the implementation of the agricultural transformation agenda of the immediate past administration is aimed at promoting agribusiness, attract private sector investment in agriculture, reduce post-harvest losses, add value to local agricultural produce, develop local infrastructure and enhance access of farmers to financial services market. The ATA was set to create over 3.5 million jobs along the value-chain of the priority crops such as cassava, rice, sorghum etc. for Nigerian teeming youths and rural women (Federal Ministry of Agriculture and Rural Development, 2011).

Cassava (*Manihot spp.*) has been identified alongside yams, rice, maize, sorghum, and millet as the main food crops in Nigeria (NEEDS, 2004). It is a perennial root crop that grows in non-ideal conditions and represents a major staple food crop in Africa, South America and Asia and was introduced in Nigeria by returnee slaves from America (Nwibo, Ezike, & Odoh 2011).

It is grown throughout the country for cash, food, feeds and raw material for agro-allied firms for the production of starch, alcohol, pharmaceuticals and confectioneries (Francisco, 2004; Onwumere, Nwajiuba & Asumugha 2006). Cassava is the chief source of dietary food energy for the majority of the people living in the lowland tropics, and much of the sub-humid tropics of West and Central Africa (Tsegia & Kormawa 2002; Echebiri & Edaba, 2008). Estimates of industrial cassava use in Nigeria suggest that approximately 16 per cent of cassava root production was utilized as chips in animal feed, 5 per cent was processed into a syrup concentrate for soft drinks and less than 1 per cent was processed into high quality cassava flour used in biscuits and confectionery, dextrin, adhesives, starch, and hydrolysates for pharmaceuticals and seasonings (Ene, 1992). At present, a wide range of traditional cassava forms (such as *gari*, *fufu*, starch, *lafun*, *abacha*, etc) are produced for human consumption (Echebiri & Edaba, 2008). Women play significant roles in cassava production. Shamsodini, Mohammadu, & Ghasemi (2011) stated that women are almost entirely responsible for virtually all activities like hoeing, weeding, harvesting, transporting, storing, processing, marketing and domestic chores which provides them with additional income-earning opportunity and enhances their ability to contribute to household food security. In a similar development, Rahman (2004) also observed that women in Nigeria form an active and reserve labour force but they rarely own the means of productions. However, the position of women in meeting challenges of agricultural development cannot be over emphasized. Women make a significant contribution to food production; they provide 60-80% of agricultural labour and are responsible for 80% of food production (Mgbada, 2002; Rahman, 2004). This was why the agricultural transformation agenda of the immediate past government was targeted at promoting rural women participation in cassava production and processing. If this is the case, why is it that the problem of hunger still persists in the study area? Why are the rural women complaining of not getting the required assistance from government at the grass root level? However, this projected far reaching end of ATA in the study area needs proper understanding of its policy awareness and its effect on rural women.

2. PURPOSE OF THE STUDY

The main purpose of this study is to examine the effect of Agricultural Transformation Agenda (ATA) policies on cassava production and processing among rural women of Rivers State, Nigeria

The Specific objectives of the study include to:

1. Examine the socio-economic characteristics of the respondents;
2. Ascertain the level of awareness of farmers (cassava farmers) of the ATA of government
3. Determine the effect of ATA policies among rural women participation in cassava production and processing and
4. Identify constraining factors facing the rural women in the ATA policies in cassava production and processing in the study area.

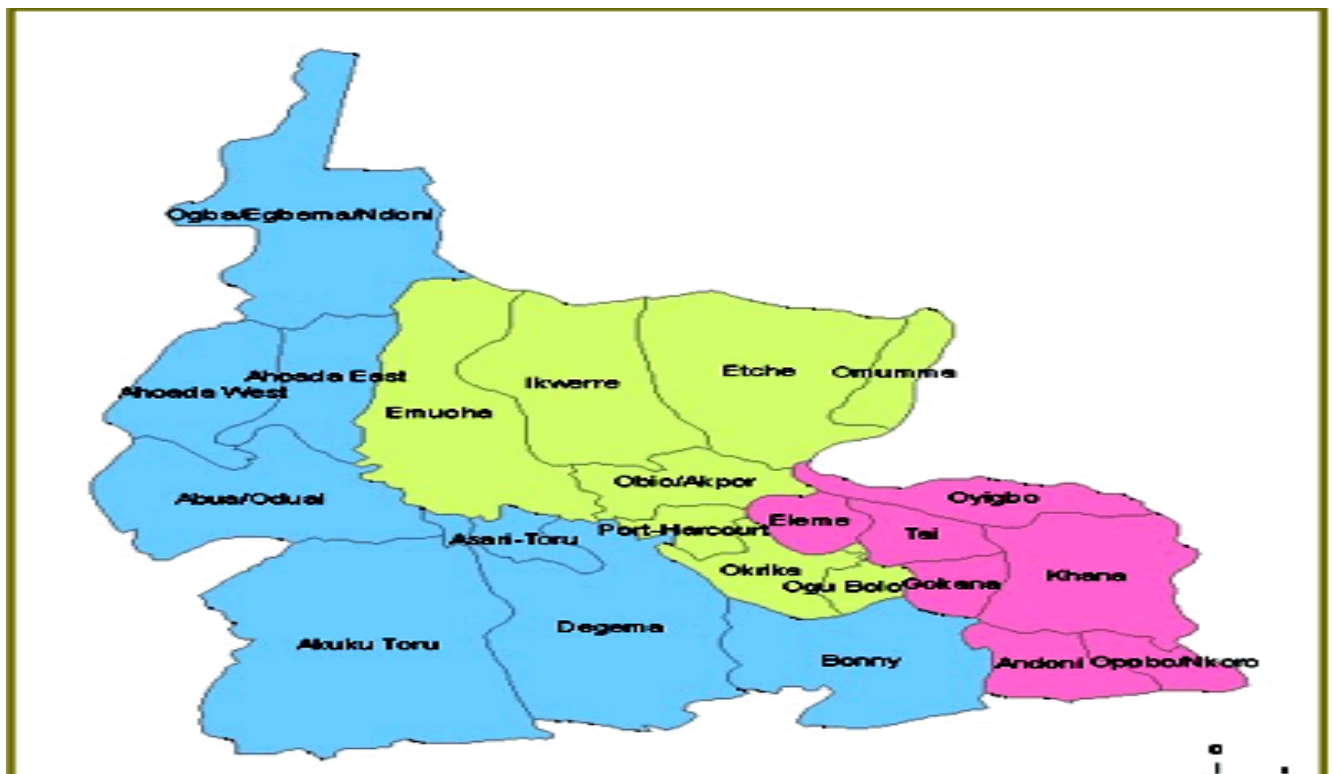


Fig. 1: Map of Rivers State

Source: Google map.com (2014)

3. METHODOLOGY OF THE STUDY

The study was carried out in Rivers State, one of the thirty six (36) states located in the Niger Delta region of the Federal Republic of Nigeria. It lies approximately between latitude 4^{ON} and 6^{ON} , and longitude 6^{OE} and 7^{OE} . It covers an area of about 21,850 square kilometres. It is bounded to the South by Atlantic Ocean, to the North by the Abia, Imo, and Anambra States, to the East by Akwa Ibom State, and to the West by Bayelsa and Delta States. The inland part of the State consists of tropical rainforest vegetation, and also features many mangrove swamps. The State is divided into twenty three (23) Local Government Areas. Fourteen out of the twenty three LGA's are located on the up-land with heights varying between 13-45m above sea level. They include; Ogoni, Ikwerre, Emohua, Ahoada East, Abua/ Odua,

Ogba/Egbema/Ndoni, Port Harcourt, Ahoada West Local Government Areas, among others (Abali, Nnah, Odinwa, & Adiola 2010).

Rainfall in Rivers State is seasonal, variable and heavy. Generally, south of latitude 5^{ON} occurs on the average, every month of the year by varying duration. The state is characterized by high rainfall which decreases from South to North. It is 4698mm at Bonny along the coast and 1862 at Degema. Rainfall is adequate for all year round crop production in the State. The mean monthly temperature is within the range of 25^{oc} and 28^{oc}.

The ethnic groups of Rivers State include; the Kalabaris, Okirikas, Ibanis, Ogbas, Ekpeyes, Ikwerres, Etches, Khanas, Gokanas, Elemes, Ndonis, Abuas, and Oduas. These ethnic groupings are based on languages and culture of the people. The state has a population of 5,198,716 which is made up of 2,673,062 males and 2,525,690 females (NPC, 2006). It covers an area of about 21,850 square kilometres. The population of the study is made up of all rural women who are into cassava production and processing in Rivers State. A total of one hundred and sixty respondents were selected for the study using purposive and multi-stage sampling technique. At first, four local Government Areas (ONELGA, Emohua, Ikwerre and Ahoada East LGA's) were purposively selected. At second stage, two communities were purposively selected from each of the LGA's which gave a total number of eight communities under study. Thirdly, twenty respondents were randomly selected from each of the communities which gave a total number of one hundred and sixty respondents. Primary and secondary data were used to elicit information necessary for the study. The primary data for the study were obtained using a structured questionnaire and responses recorded from the respondents during the focus group discussion. Data were analyzed using descriptive such as frequency count, percentages and mean. Inferential statistic adopted was Probit regression.

4. HYPOTHESIS OF THE STUDY

Ho: There is no significant relationship between the socio-economic characteristics of the respondents and the effect of ATA policies on rural women participation in cassava production and processing.

5. MEASUREMENT OF VARIABLES

Socio economic characteristics of respondents

Age of respondents- (in years)

Marital Status - 1 = married, 0 = single;

Level of education attained = (years of schooling);

Religion 1 = Christianity, 0 = others.

Monthly income- (in Naira)

Household size – (No. of persons in a household)

Level of awareness

This was measured using a four point Likert-type scale of: (4) very highly aware, (3) highly aware, (2) not highly aware and (1) not aware.

Decision rule: Any mean score of 2.50 and above is regarded as “highly aware” while mean score below 2.50 is regarded as “not aware”. Example: $1+2+3+4=10/4=2.5$; 2.50 is regarded as the critical value.

Specifically, the scales were categorized as follows:

- 3.50 – 4.00 = Very highly aware
- 2.50 - 3.49 = Highly aware
- 1.50 – 2.49 = Not highly aware
- 1.00 – 1.49 = Not aware

Effect of ATA policies on women participation in cassava production and processing

This was measured by listing the factors related to ATA policies for the respondents to indicate on how it has affected them. Their response attracted (4) to a very great effect, (3) to a great effect, (2) to a little effect, and (1) to a very little effect.

Decision rule: Any mean score of 2.5 and above is regarded as a great effect while mean score below 2.5 is regarded as having a little effect. Example: $1+2+3+4=10/4=2.5$; 2.5 is regarded as the critical value.

Specifically, the scales were therefore categorized as follows:

- 3.50– 4.00 = To a very great effect
- 2.50 – 3.49 = To a great effect
- 1.50 – 2.49 = To a little effect
- 1.00 – 1.49 = To a very little effect or no effect

Constraining factors

Perceived inhibiting factors were listed and the respondents were asked to respond accordingly using a four point Likert-type scale of strongly agree (4), agree (3), disagree (2), and strongly disagree (1) were adopted.

Decision rule: Any mean score of 2.5 and above were considered as agree while mean scores below 2.5 were regarded as disagree. Specifically, the scales were therefore categorized as follows:

- 3.50 – 4.00 = Strongly agree
- 2.50 – 3.49 = Agree
- 1.50 – 2.49 = Disagree
- 1.00 – 1.49 = Strongly disagree

6. RESULTS AND DISCUSSION

6.1 Socio-economic characteristics

Table 1 reveals the demographic information of the respondents. The age bracket of 50-59 had 63.75 per cent.

Table 1: Socioeconomic characteristics of the respondents

Variables	Frequency	Percentage (%)
Age		
< 20yrs	4	2.50
20-29yrs	17	10.62
30-39yrs	10	6.25
40-49yrs	11	6.88
50-59yrs	102	63.75
60yrs & above	16	10.00
Marital status		
Married	130	81.25
Single	9	5.62
Separated	11	6.88
Widow	10	6.25
Educational attainment		
No formal education	128	80.00
FSLC	5	3.13
SSCE/WASC	15	9.37
OND/NCE	6	3.75
B.Sc/ B.Ed	4	2.50
Post-graduate degree	2	1.25
Religion		
Christianity	136	85.00
Islam	1	0.63
Traditional	23	14.37
Monthly income (₦)		
< 10,000	6	3.75
10,000-20,999	7	4.38
21,000-30,999	121	75.62
31,000-40,999	10	6.25
41,000-50,999	8	5.00
51,000-60,999	4	2.50
61,000 & above	4	2.50
Household size		
< 2	2	1.25
2-3	3	1.87
4-5	12	7.50
6-7	37	23.13
7 & above	106	66.25

Source: Field survey, 2016

This finding corroborates with findings of Okwoche, Obinne, & Otijele (2010) who stated that respondents within the age range of 31-60years are within their middle age range and are the work force of the economy, hence, they will be able to support poverty alleviation programmes.

Responding on marital status, Table 1 further revealed that 81.25 per cent of the respondents were married. It was further discovered that 80 per cent of the respondents did not receive formal education. This finding corroborates with the result obtained during the focus group discussion. The policy implication of this finding shows that data on literacy are useful in educational policy and planning purposes of service providers. Information on educational attainment is also useful in determining the quality of population and performance of

educational policies. Christianity pocketed other religion with 85 per cent while the monthly income within the range of ₦21, 000.00 - ₦ 30,999.00 recorded 75.62 per cent. Household size of 7 and above, recorded 66.25 per cent. One reason for high percentage in household size may be due to polygamous system of marriage that is allowed in the area. The household size is an indication of the pressure on income of household members. The findings provided data that have policy implications on family health programme and developmental issues such as child spacing, housing and provision of basic social amenities by service providers (NPC, 2006).

6.2 Test of the hypothesis

Ho: There is no significant relationship between the socio-economic characteristics of the respondents and the effect of ATA policies on rural women participation in cassava production and processing.

Table 2 reveals the Probit regression estimates of the socioeconomic characteristics of the respondents and effects of ATA policies on rural women participation in cassava production and processing. Marital status, educational attainment, religion, occupation, and income level of the respondents recorded a positive coefficient of 0.016, 0.005, 0.005, 0.013, and 0.026 respectively and were not significant at 0.05 probability level.

Table 2: Probit regression estimates of the socioeconomic characteristics of the respondents and effects of ATA policies on cassava production and processing

Variables	Coefficient	Standard error	Z statistics	p-value
Age	0.009	0.035	0.255	0.799
Marital status	0.016	0.056	0.290	0.772
Educational attainment	0.005	0.021	0.241	0.809
Religion	0.005	0.084	0.059	0.953
Income	0.026	0.021	1.203	0.229
Household size	-0.015	0.038	-0.401	0.689
Intercept	-3.127	0.280	-11.150	0.000
Chi-square value	131.638 ^{ns}			

Source: Field survey, 2016

χ^2 - value = 131.638, (p > 0.05)

This implies that marital status, educational attainment, religion, occupation, and income status of the respondents were not considered as determinant factors of ATA policies in rural women participation in cassava production and processing in the study area, though a positive correlation was recorded. The positive correlation is line with the *apriori* expectation and findings of Adegboye & Oyesola (2010) that the higher the educational level of respondents; the more active they will participate in any development agenda. Similarly, it was also observed by the authors that marriage is a mark of responsibility and it cause people to be more stable and thinking of things to benefit their immediate communities. From the analysis, the null hypothesis which states that there is no significant relationship between

socioeconomic characteristics of respondents and effects of ATA policies on rural women participation in cassava production and processing were accepted.

6.3 Level of awareness

Table 3 reveal that majority of the respondents were not aware of some of the ATA policies relating to their source of livelihood (cassava production and processing). This finding corroborates with the result obtained during the focus group discussion.

Table 3: Mean response of the level of awareness of the respondents about ATA policies of Government on Cassava production and processing

Information related to ATA policies on cassava	Mean	Remarks
Government's effort to promote access to procurement of inorganic fertilizer through e-wallet	1.60	Not aware
Government's effort on procurement of improved cassava stem	2.00	Not highly aware
Promotion of formation of cassava-based farmers organization	2.00	Not highly aware
Provision of market information to cassava-based farmers and circumvention of risk and uncertainties in farm operations	1.70	Not aware
Promotion of diversification of cassava into other products	2.60	Highly aware
Creation of efficient commodity market for cassava production and processing	2.45	Not highly aware
Promotion of advocacy programme of cassava value chain	2.30	Not highly aware
Provision of credit facilities to cassava based farmers	1.70	Not aware
Stabilization of price of cassava as a food commodity	1.45	Not aware
Effort at creating a data base for cassava-base farmers	2.80	Highly aware
Government effort on agricultural extension services relating to new planting methods of cassava and other improved cultural practices	1.45	Not aware
Information on provision of cultivable land to cassava-based farmers	1.30	Not aware
Promotion of mechanized cassava production and processing	1.35	Not aware
Promotion of periodic training of cassava-based farmers	1.40	Not aware

Source: Field survey, 2016

Majority of the respondents stated that they were not aware of any information relating to federal government agricultural transformation agenda, that they were only asked to register as farmers at the local government which most of them attested that they did not participate due to previous experience they encountered with other agricultural development programmes initiated by federal government which at the end failed (FGD, 2016). This result was not in corroboration with findings of Oluwasusi & Akani (2015) who discovered that all the cassava farmers were aware of most of the government's policies on farm input and cassava production under ATA in his study area.

6.4 Effect of Agricultural Transformation Agenda policies

Table 4 shows that the agricultural transformation agenda policies relating to cassava production and processing had a very little effect on the respondents' participation in cassava production and processing in the study area.

Table 4: Mean response of effect of Agricultural Transformation Agenda policies as indicated by the respondents on level of participation in cassava production and processing

Variables	Mean	Remarks
Increased production level of the respondents	1.45	Very little effect
Improve wellbeing of cassava-based farmers	1.35	Very little effect
Fertilizer affordability through e-wallet	1.25	Very little effect
Built strong linkage with extension agents	1.20	Very little effect
Dignity in farm operation	1.30	Very little effect
Easy access to improved planting materials	1.25	Very little effect
Wider opportunity to improving production information	1.20	Very little effect
Improve entrepreneuring skills	1.30	Very little effect
Market opportunities with subsisting imports with local production	1.25	Very little effect
Built close partnership with government at all levels	1.20	Very little effect
Improve processing of cassava products	1.30	Very little effect

Source: Field survey, 2016

This result is line with the information received from the respondents during the focus group discussion with some of the key stakeholders across the communities under study. Most of the rural women reported that they were not even aware of the development effort by government not to talk of participating. They further reported that one can only participate in any development agenda when they are aware of such programme (FGD, 2016).

6.5 Constraining factors

Table 5 shows that the major constraints the rural women faced in cassava production and processing under ATA included, poor extension services (Mean=3.04), bureaucratic bottle-neck of government (Mean=3.02), cultural practices on land ownership (Mean=3.00), and lack of information of ATA policies (Mean=2.90).

Table 5: Mean response on constraining factors of Agricultural Transformation Agenda policies in the study area

Factors	Mean	Remarks
Poor extension services	3.04	Agree
Bureaucratic bottle-neck of government for accessing farm inputs	3.02	Agree
Cultural practices on land ownership by women	3.00	Agree
Lack of information of ATA related policies	2.95	Agree
Poor mobile network for e-wallet	2.90	Agree
Illiteracy	2.90	Agree
Inadequate training of extension staff	2.85	Agree
Poor perception of the ATA policies due to past experience of failed agricultural development programmes	2.80	Agree

Source: Field survey, 2016

Other factors included; poor mobile net-work (Mean=2.90), illiteracy (Mean = 2.90), inadequate training of extension staff (2.85), poor perception (2.80). These findings is in corroboration with the findings of Oluwasusi & Akani (2015) who also identified staff bureaucracy of the government, lack of technical know-how on the part of the extension

officers, inadequate extension agent as some of the constraints faced in utilizing ATA policies.

7. CONCLUSION AND EXTENSION IMPLICATIONS

Based on the findings of the study, it is therefore concluded, that marital status, educational attainment, religion, occupation, and income status of the respondents were not considered as determinant factors of ATA policies in rural women participation in cassava production and processing (χ^2 - value = 131.638, ($p > 0.05$). The respondents were not highly aware of the ATA policies relating to cassava production and processing. The ATA policies of the immediate past administration of Federal Government of Nigeria affected the participation of rural women in cassava production and processing to “a very little extent”. Poor extension services, bureaucratic bottle-neck of government, cultural practices on land ownership, and lack of information on ATA policies were among other inhibiting factors faced by rural women under the ATA policies.

The extension implication of this study is for government at all levels to synergize with extension administrators to put in place appropriate extension services on benefits of ATA to rural women at the grass root level. The removal of bureaucratic processes that hinder rural women from effective accessibility of ATA policies and its benefits will create room for effective information delivery and the propensity of rural women participation in agricultural development programmes.

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REACHING CROSSROADS TO PART WAYS: CAN EXTENSION AND ADVISORY SERVICES MEET CHANGES AHEAD?

Musa, M. W.¹⁵ & Umar, S.¹⁶

ABSTRACT

Over the centuries, national and international extension and advisory services have witnessed a series of evolutions in definition, approach and focus. As result, the evidence of what constitutes a successful extension and advisory services differ, are similar or controversial. In recent years, the inadequate performance of extension and advisory services, coupled with the increasing challenges of global warming is raising questions in Nigeria and elsewhere. This paper attempts to address the question: How can extension and advisory services effectively meet the needs of rural producers under changing conditions? The paper reviews various extension and advisory services in Nigeria, with reference to their potentials, constraints and what lessons are derivable for future interventions. As obtains in Nigeria, over 80% of the basic foods consumed are largely produced by rural men and women smallholder farmers, fisherfolk and livestock keepers. Despite their significance to national and global development, a large proportion of these rural farm families have not been sufficiently assisted by research, extension and advisory services. More than ever before, rural farm families are in continuous need of institutional support systems that can strengthen their capacities, give access to sustainable technologies and offer links to better market opportunities.

Key words: Extension approaches, rural, farm families, change, advisory services

1. INTRODUCTION

There is no denying that extension and advisory services are central to realizing national development goals as far as food security, economic development and sustainable natural resource management is concerned. Since the creation of the terms ‘extension service’ in the middle of the 19th century in Ireland and ‘advisory services’ in the early 20th century in Britain, the scope of extension and advisory services have expanded from the area of agriculture to areas of education, health and legal services (Jones & Garforth, 1997; Swanson, 2008:3; Ogunbameru Undiandeye, & Ani, 2008:3-4; Swanson & Rajalahti, 2010:1; Wikipedia, 2016:1). These forms of extension and advisory services are closely linked and are intended to support rural farm families improve their productive, physical, mental capacities as well as strengthen their rights over natural resource usage.

Despite the core universal value of extension and advisory services towards improving the livelihood of rural farm families, during the last 20 years, the practice and approach to extension and advisory services in many countries have undergone changes (Swanson, 2009; Sulaiman & Davis, 2012; Swanson & Davis, 2014). Reports by Axinn (1988), Swanson &

¹⁵ Department of Agricultural Economics and Rural Sociology, Faculty of Agriculture/Institute for Agricultural Research, Ahmadu Bello University, PMB 1044, Samaru-Zaria, Kaduna State, NIGERIA. Tel:+234(0) 8169027667; Fax: +234 069 50563. Email: musamike@yahoo.com.

¹⁶ Department of Agricultural Economics and Rural Sociology, Faculty of Agriculture/Institute for Agricultural Research, Ahmadu Bello University, PMB 1044, Samaru-Zaria, Kaduna State, NIGERIA. Tel:+234(0) 8169027667; Fax: +234 069 50563. Email: sulaimanumar@hotmail.com

Rajalahti (2010) have confirmed that the process of extension and advisory services has been operated under a portfolio of approaches which include:

1. The **General Agricultural Extension Approach**: This is a centralized approach which focuses on improving the livelihood of rural farm families through information dissemination and transfer of improved agricultural technologies in agreement with national agricultural and rural development objectives.
2. The **Commodity Specialized Approach**: The focus of extension and advisory services is market-orientation with emphasis on production of major export crops such as rubber, tobacco, coffee, cocoa and cotton with inputs support. The aim is to increase income of rural farm families through profit sharing generated from foreign exchange earnings.
3. The **Training and Visit Approach**: This approach is involved with technology transfer to rural farm families through planned schedule of visits, training of extension agents and subject matter specialists.
4. The **Agricultural Extension Participatory Approach**: This is a decentralized and flexible approach which permits active participation of rural farm families in joint cooperation with research and extension professionals in technology development process.
5. The **Project Approach**: This approach concentrates on demonstrating improved techniques and methods that could be extended and sustained after the project period in location-specific settings, over a given time period, often supported with resources from external intervention.
6. The **Farming Systems Development Approach**: This is characterized by a holistic 'problem-solving approach involving multi-disciplinary teams with a strong degree of rural farmers' participation. Achievement is rated by the magnitude by which rural farmers continue to use the improved technologies developed.
7. The **Cost-Sharing Approach**. This approach assumes that cost-sharing with rural farm families and their willingness to pay will help to address local level problems and thus facilitate farmers' self-improvement.
8. The **Educational Institution Approach**. The focus of this approach is based on the assumption that educational institutions have the technical knowledge and research capacity to provide extension services for rural farm families.

The evidence of the different approaches from the foregoing classifications reflects that distinctions between types are not total but cross-cutting. By implication, the different approaches tend to offer opportunities in understanding the historical transitions and the platforms under which the short comings of extension and advisory services can be assessed. In this case, to ascertain what is 'good', 'bad' or 'best' extension and advisory services continuous to remain a key challenge.

After decades of inadequate performances in agriculture and rural development, national governments of developing countries and international donors are increasingly recognizing

that earlier approaches to extension and advisory services have reached crossroads. Therefore reforms are needed that will help farm families increase productivity, earn more money and contribute to food security. Such changes include a paradigm shift from a top-down, centrally controlled approach to a multi-faceted and multi-institutional approach that permits many different organizations and stakeholders to interact with farmers as equal partners in the development process. Nevertheless, how this can be pursued is raising so many questions. As obtains, the focus of this paper is triggered by the following questions: What are the reforms needed in extension and advisory services to effectively meet the needs of rural farm families under changing conditions? How will the reforms in extension and advisory services ensure increased investment, equitable and resilient production systems in the coming decades?

1.2 Review of Extension and Advisory Services in Nigeria

The origins of extension and advisory services in Nigeria can be traced to a colonial and post-colonial past between the years 1893 to 1968. With the direct involvement of government under colonial rule, the focus of extension policy was devoted to improvements in the quality and production of specialized commodity crops for exports like cocoa, rubber, palm oil, cotton and groundnut, to support the British agro-industries and markets in Europe. To a large extent, this contributed to a lop-sided development in food production and market opportunities for rural farm families (Williams, 1978:75; Arokoyo, 2008: 136).

During the post-colonial era, agricultural extension and advisory service became organized under three sources. Firstly, it was preceded and affiliated with government-initiated agricultural and rural development programmes. The government-initiated extension and advisory services were implemented largely through the Federal Ministry of Agriculture and Rural Development (FMARD). The programmes include the:

1. National Accelerated Food Production Project (NAFPP) in 1972,
2. River Basin Development Authority (RBDA) in 1973,
3. Agricultural Development Projects (ADP) in 1975,
4. Operation Feed the Nation Programme (OFN) in 1976,
5. Green Revolution Programme (GRP) in 1980,
6. Accelerated Development Area Project (ADAP) in 1982,
7. Multi-State Agricultural Development Projects (MSADP) in 1986,
8. Directorate of Food, Roads and Rural Infrastructure (DFRRI) in 1986,
9. National Directorate of Employment (NDE) in 1986,
10. Nigeria Agricultural Insurance Scheme (NAIS) in 1987,
11. National Fadama Development Project (NFDPP) in 1992
12. Poverty Alleviation Programme (PAP) in 2000 and
13. National Economic Empowerment and Development Strategy (NEEDS) in 2004.

Secondly, there were extension and advisory programmes initiated by private organizations with specific clientele in focus. Thirdly, international donors including (World Bank, International Fund for Agricultural Development, IFAD, United States Agency for International Development (USAID) and Food and Agriculture Organization (FAO) of the United Nations) have made significant contributions towards the initiation and implementation extension and advisory services in Nigeria. Notable examples are the unified extension system, the training and visit extension system of the World Bank.

In general, the evolution of extension and advisory services in Nigeria to what obtains today, are largely strategies aimed at modernizing the existing philosophy of supporting rural farm

families in line with the World Bank's mission of combating poverty extremes and promoting shared prosperity. Inherent in the many strategies to assist rural farm families, the World Bank and partner donors in collaboration with the Federal Government of Nigeria reinforced the extension and advisory services by: establishment of research institutes alongside with extension work stations and experimental farms; rigorous application of the training and visit approach to farmers; establishment of adoption village strategies and diverse farm settlement schemes. It must be borne in mind that despite record of considerable success, the implementation of extension and advisory services in Nigeria has not been without complexities and short comings. Factors responsible for these include : inability to link technological recommendations and rural families to promising market opportunities; dominant top-down blanket recommendations laced with weak strategies in technology development and transfer; prevalence of weak communication and institutional linkages between farmers, the public and private sector extension service providers; poor leadership and managerial ability; the high costs of maintaining these services and the general decline in funding for them; the lack of clear and legal policies adopted and lack of flexibility to sufficiently understand and address the site-specific needs of farm families.

1.3 Moving Forward

The 21st century represents an era in which the phenomenon of global change is rapidly occurring than ever before. In Nigeria and other regions of sub-Saharan Africa, over 80% of the basic foods consumed and marketed, are largely produced by diversities of rural men and women smallholder farmers, fisherfolk and livestock keepers. For these rural farm families, the impact of global climate change and recent fall in global commodity prices is deepening risks and uncertainty, thereby placing them in gloomy economic positions. As obtains in Nigeria, a large proportion of rural producers have not been sufficiently assisted by research, extension and advisory services. In this regard, the demand for extension and advisory services is increasing among rural farm families, most especially as they are confronted with the urgent task of adjusting to changing conditions.

It has been argued that the current situation of food insecurity, rural poverty, and un-competitiveness of Nigeria in the global food market can be attributed to two factors. Firstly, that the Nigeria's agricultural sector is underperforming its potential. Secondly, that Nigeria's National Agricultural Research and Extension System (NARES) has not been able bring about a sustainable agricultural development strategy capable of ensuring national food sovereignty, improving rural livelihoods and making Nigeria's agriculture to compete favourably in global markets (Federal Government of Nigeria, 2008; Arokoyo, 2009). Pressure is now mounting on national government and donor partners for reforms in extension and advisory services that will accelerate agricultural growth and rural development amidst change. However, given the high costs of operating earlier extension and advisory services and the general failure in funding them, many people are now questioning whether the search for alternative reforms of national extension and advisory services will become more appropriate and sustainable in the near future.

1.4 Conclusion and Policy Implications for Extension and Advisory Services

The types of extension and advisory services obtainable in any nation is largely determined by its opportunity structure (agroecological, infrastructural, policy, political-economic, and socio-cultural context) and the processes of change occurring in that nation (Peterson, 1998). Thus, the several decades of experiences and evolutions undergone by extension and advisory

systems in many countries provides an opportunity to reflect on the lessons learned from a wide range of practices for future directions. In recent years, development professionals are beginning to advocate that as part of the move toward reforms, the definition and practice of extension and advisory service requires a shift from the unilateral to multi-faceted and multi-institutional perspective which focuses on strengthening relationships, the development of innovation systems, the skills and management capacities of rural farm families and conservation of their natural resource base (NRI, 2014:2). For instance as posited by Christoplos (2010), the re-definition and performance of extension and advisory services should be seen as “systems that facilitate the access of farmers, their organizations and other market actors to knowledge, information and technologies; facilitate their interaction with partners in research, education, agribusiness, and other relevant institutions; and assist them to develop their own technical, organizational and management skills and practices”. Relatedly, in Nigeria now, the critical challenges facing agricultural extension and advisory services, is how to reform it into a participatory-driven service that will be in charge of the needs of all stakeholders along the targeted commodity value chains.

At a time when rural farm families are faced with the harsh realities of the impacts of climate change, fall in global commodity prices, conditions of endless downward spiral of budget cuts and debt burdens, the search for practical solutions that will enhance their sustained survival becomes critical. While different strategies need to be sought to transform national agricultural extension and advisory systems, questions remain on how national and international governments aim to cooperate towards new sustainable development frameworks and pathways. In this context, the functionality of extension and advisory services to meet changes ahead would require putting in place the mechanisms for:

1. Mobilization of increased financial support through long-term financial safety nets and equitable sharing formula to scale-up viable practices;
2. Adoption of appropriate national policy that will address the critical issues of the roles and responsibilities of all the stakeholders (including the various tiers of government, the private sector, Farmers’ Associations, Non-Governmental Organizations and Community-Based Organizations and gender mainstreaming) in extension and advisory practice;
3. Creating effective market linkages and supporting commodity value chains for low income rural farm families and consumers;
4. Provision of facilities to enable access to new knowledge and information sharing through improvements in the quality and efficiency of information communication technologies.

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IS AGRICULTURE EXTENSION POSITIONED TO PROMOTE AGRIPRENEURSHIP IN SOUTH AFRICA?

Stevens, J. B.¹⁷

ABSTRACT

A shift from agriculture to agribusiness is an essential pathway to revitalize small scale agriculture in South Africa and to make it more attractive and a profitable venture. The question is whether small scale farmers can become entrepreneurs and how well is extension positioned to support farmers to foster entrepreneurship? There are two parts to entrepreneurship: the first is the managerial skills required to start and run a profitable farm business. Secondly is the “entrepreneurial spirit”. Important is to realise that you cannot create an entrepreneur, but you can create the environment that will help them thrive. Governments and donors must invest in institutions and infrastructure that support them. Economic policies and financial incentives must be put in place to inspire a generation of agripreneurs. This paper wants to emphasise the importance that farmers must be linked to markets to take advantage of the opportunities arising along the agribusiness value chain. Successful entrepreneurship requires a strong enabling environment of which political will and leadership is important but also strong private interest. Extension has a critical role to play in supporting farmers to develop their entrepreneurial skills through training and by providing technical assistance.

Key words: Agripreneurship, entrepreneurs, entrepreneur skills, enabling environment.

1. INTRODUCTION

Sub Saharan Africa represents the “last frontier” in global food and agricultural markets. It has more than half of the world’s uncultivated but agricultural suitable land and in many countries the extensive water resources has scarcely been utilised. Although agriculture is central to Africa’s agenda, it is not sufficient to focus only on production agriculture. Production agriculture must be linked to agribusiness. Recently international agencies and African governments have recognised the growing role of agribusiness, as evidenced by a book recently being published: “Agribusiness for Africa’s prosperity” (UNIDO, 2011); the African Agribusiness and Agro Industries Development Initiative (3ADI) (UNIDO, 2010) and the Strategic Framework for Pillar 2 on markets and agribusiness in Comprehensive Africa Agricultural Development Program (CAADP). Agriculture production and agribusiness together constitute an average of around 45% of the economy of Sub Saharan Africa. In Sub Saharan African countries, the share of agribusiness (including logistics and retail) in gross domestic product (GDP) is plus minus 20%, while the share of agricultural production is 24% for low income countries, although only a small part of the production is commercialised. Agribusiness (upstream and downstream) from farming accounts for 78% of the total agricultural value chain (logistics, retail, input supply and processing) (Brookfield Agricultural Group, 2010). Many of the agricultural value chains are dualistic, featuring an informal chain serving the lower income consumer in the domestic market, alongside a formal chain with more processing and stronger quality controls for higher income, domestic consumers and /or exports. The structure of the agribusiness is determined by the fact

¹⁷ Department of Agricultural Economics, Extension and Rural Development, University of Pretoria, Private Bag X 20 Hatfield, Pretoria, 0028. Email: joe.stevens@up.ac.za

whether the demand for the specific primary agricultural product is for undifferentiated (bulk commodities) or semi-processed products (differentiated primary products) and shelf life of a product (as with fresh fruit, vegetables and livestock products). A major opportunity exists to drive agribusiness development through the development of a new spirit of enterprise "agripreneurship" and the increased individual need for responsibility for running their own business. Many small scale farmers and extension organisations understand that there is little future for farmers unless they become more entrepreneurial in the way they run their farms. They must increasingly produce more for markets and for profits. Dollinger (2003) defines agripreneurship as the creation of an innovative economic organisation for the purpose of growth or gain under conditions of risk and uncertainty in agriculture.

This paper wants to emphasise the importance that farmers must be linked to markets to take advantage of the opportunities arising along the agribusiness value chain. Successful entrepreneurship requires a strong enabling environment of which political will and leadership is important but also strong private sector interest. Extension forms part of a set of supporting institutions which has a critical role to play in supporting farmers to become more entrepreneurial through deliberate innovative actions.

2. ENTREPRENEURSHIP AND QUALITIES REQUIRED FOR AGRIPRENEURSHIP

Entrepreneurs are individuals who identify creative business opportunities, take the risk of establishing a business, and have talent and skills to manage and grow a business – in the process creating wealth and employment. Entrepreneurs are also innovators, who is looking for better and more efficient and profitable ways to do things. Being innovative is an important quality of a farmer-entrepreneur, especially when the business faces strong competition or operates in a rapidly changing environment (as South African poultry farmers are currently facing with implementation of the Agoa agreement between South Africa and the USA).

Can small scale farmers become entrepreneurs? The answer is Yes - all over the world farmers have shown they have the remarkable ability to adapt and they always look for better ways to organise their farms to make a living. For farmers to become entrepreneurs they need to become more market oriented and learn to take calculated risks to open or create new markets for their products. Singh (2013) defines an entrepreneur as an individual who recognises an opportunity or unmet need and take risks to pursue it. According to the Global Entrepreneurship Monitor (GEM) that measures entrepreneurship activity in 70 countries, the overall entrepreneurial activity indicating the percentage of economically active adults who are involved in total early stage entrepreneurial activity (TEA) as well as established entrepreneurs in South Africa is 9%. This is well below sub Saharan average of 41%, United States at 21% and European Union at 15% (Strydom et al, 2016). These authors also identify a spectrum of entrepreneurs and business owners that is significant to consider in venture development. At the one end there is the opportunity entrepreneur, motivated by a business opportunity to get started. At the other end there is the necessity entrepreneur, who needs to start a business because they have no other choice (therefore starting a business out of necessity for an income as they lack employment).

Table 1: Necessity versus opportunity entrepreneurs in South Africa (Antoinettes, 2016)

	2001	2005	2009	2013	Ave SSA
Necessity-driven (% of TEA)	18.3*	39.5	32.7	30.3	38.6
Opportunity-driven (% of TEA)	64.7	57.1	63.7	68.6	57.9
Ration of opportunity vs necessity	3.53	1.44	1.94	2.26	1.55

Entrepreneurial skills and qualities for agripreneurship are considered to those competencies required to accomplish tasks and activities to ensure that the farm business is growing and developing. Entrepreneurs need more than just their personality or personal traits; they also need a range of competencies, knowledge, skills and behaviours. All entrepreneurs are not the same and there are obviously major differences between entrepreneurs. The critical important skills and success factors for entrepreneurship which contribute to successful business are ingenuity, leadership and calculated risk taking.

Ingenuity includes knowledge, skills to recognise opportunities, conceptual thinking and understanding of business environment and to be creative. Creativity can involve adjusting or refining existing procedures or products and problem solving skills. The application of new ideas requires innovative skills. As innovators they understand the value chain concept and are often prepared to take risks and to invest in goods and services that require high capital investment, because they believe the chance to make a profit will outperform these requirements. Successful farmer entrepreneurs are often also strong leaders who display important types of interpersonal behaviour such as motivation, persuasion, commitment, team building and focused. One of the critical elements for successful entrepreneurship is good business relations and cooperation with players in the value chain. Entrepreneurs usually have an extensive network of professionals, experienced partners during the establishment phase of the business. McElwee (2006) identified three personally traits that differentiate successful farmer from others. They have more belief in their ability to control events, problem-solving plans and social initiatives. Thirdly entrepreneurs are not prepared chances but they are willing to take calculated risks. For this to be purposefully, they first determine what the risk entails by evaluating it themselves (doing marketing or feasibility research) or with the help of experts. Furthermore, they manage risk by taking responsibility for control and being involved in the basic aspects of the business (Strydom et al, 2016). They control their business by getting access to information, and calculate the probable outcome before they make decisions. Not all agripreneurs have all these skills, and therefore they need to develop these characteristics with the help of professional support. It is also important to note that these uniquely entrepreneurial skills and qualities are not effective in isolation; they need to be integrated in thought and action. Entrepreneurial farmers combine technical skills, entrepreneurial competencies and their resources to develop new farm business opportunities.

3. ENTREPRENEURIAL ENVIRONMENT

Entrepreneurs operate in a complex and dynamic environment. They are part of a larger collection of people including policymakers, suppliers, farmers, traders, processors and transporters, each of whom has a role to play in the value chain (Figure 1). A farmer with an entrepreneurial spirit energetically, enthusiastically but carefully makes different decisions about his farm business in the context of the value chain.

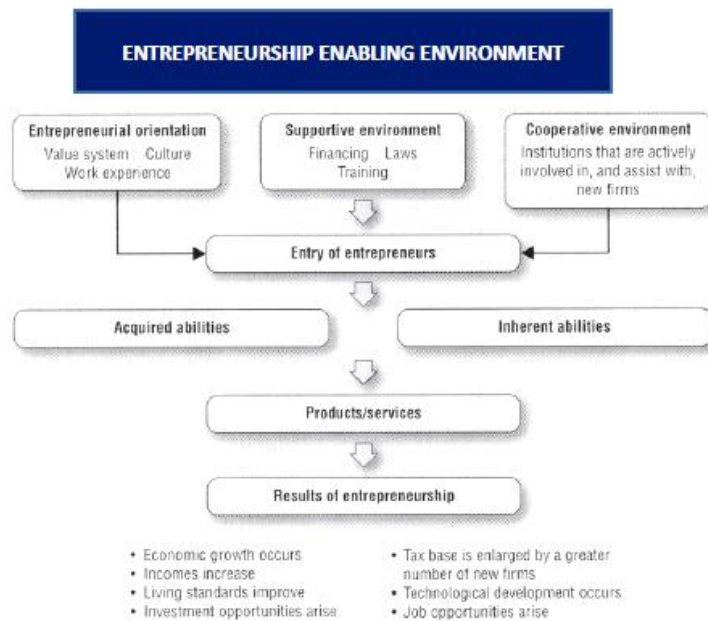


Figure 1: The farmer entrepreneurial environment (Antonites, 2016)

- The environment is affected by government policy and the level of investment in agriculture. This environment therefore varies in different countries, and to create an environment that encourages farm business the following challenges and barriers should be addressed:
- Poor or absent basic infrastructure such as poor roads, inadequate opportunities to enter market opportunities, irregular supply of electricity.
- Unsupportive policy and regulations: land tenure and ownership, complexity of registering business and general bureaucracy.
- Access to affordable financial support (especially investment capital).
- Social barriers – the concept of entrepreneurship not always common to every culture or society. Creativity and innovation not always valued traits – some governments create social systems that create dependence and hopelessness.
- Lack of suitable training facilities (right place and time) and offering of appropriate entrepreneurial skills training – specific with regard to creativity, opportunity and innovation.
- Market related risks- the farmer must weigh up the opportunities and risks and decide on the combination of markets to use. Whichever markets they use, farmers face risks to reach them.
- Lack of support services and trained extension staff – farmers advancing through the five stages of development will require information, advice, training and support. Information needs to be organised, packaged and communicated in ways that are helpful to agripreneurs.
- Marketing constraints – running a farm business, production must always be linked to market demand and scope. Access to markets often constrained by factors like: poor communication infrastructure, poor marketing facilities, lack of timely market information, limiting bargaining power and perhaps negative attitude of buyers towards farmers.

4. AREAS OF ENTREPRENEURSHIP DEVELOPMENT INTERVENTION BY EXTENSION

The development of a farm business occurs in five phases namely: establishment, survival, early growth, rapid growth and maturity. Understanding these stages of farm enterprise development helps extension advisors to know when and how to intervene with appropriate support and create suitable opportunities to learn. Farmers require support and advice from extension in identifying goals; preparing, designing and implementing of efficient farm business plans. The advice and support must cover areas beyond production-led services; it must be as wide to include aspects of running a profitable, market-oriented farm business.

Secondly, farmers' managerial competencies must be developed and strengthened through training and development interventions as the business grows. Agripreneurs need to continue increasing their managerial ability to meet the demands of a complex and competitive environment of doing business. They require being well skilled in the following aspects:

- Cash flow management
- Productivity and quality management – competition among farm businesses based on product quality and timely delivery performance
- Networking for information – buyers, suppliers, friends and other farmers
- Competence in the use and application of computers and electronic equipment to access market and technical information

Group or coherent entrepreneurship should be promoted where a group or like-minded farmers are willing to work together on a joint venture. This often requires extension to support farmers with the mobilisation of the group and facilitate linkages along the value chain. Important is to know when to downscale the support to handover the management and entrepreneurial functions to the group. A prerequisite for success is that ownership of the initiative should remain in the hands of the farmers.

Farmers can capture more value by producing differentiated commodities (like organic fruit or free range chicken) for a limited or niche market; or adding value by entering into market or producing contracts. Since value adding requires knowledge and understanding of the value chain and its bottlenecks, extension can support farmers with identifying, investigating and evaluating opportunities.

One way of growing is the changing production systems to produce for specific market demands by developing or adapting new technologies and innovative practices. Extension should encourage farmers to innovate where required and share these experiences with other farmers. Information Communication Technology like smartphones, tablets and other computer-based systems are powerful tools to educate and inform farmers about new ideas, technologies and practices (especially where budgets are limited and transport availability is challenging). It can be harnessed for the benefit of both farmers and extension without compromising the importance of human and unique local factors.

Successful farmer entrepreneurs are strategic in their planning and implementation of plans ("big picture thinking"). They look at their farm business from a holistic and long-term view, and make sure that major farm business activities and aspects compliment the objectives and goals they have set for the business. They look at ways to strengthen the competitiveness of the farm business through satisfying potential buyers, achieving performance targets and staying focused on the long-term goals of the business. Extension should support farmers in planning a long-term strategy for the farm business, help with implementing and monitoring the outcomes and where required to adjust when conditions change, support the farmer with decision making.

Facilitating the learning process is an important role that extension advisors should play, as many of farmers are not aware of the need to develop their entrepreneurial competencies and skills. However the majority of extension advisors in South Africa is trained in specific technical areas of agriculture, and therefore themselves need specialised training in order to become effective trainers and facilitators of entrepreneurship. Although extension advisors perhaps cannot do the actual training in entrepreneurship, they can still exchange experiences, share information and participate in joint problem solving. They can help farmers to link with the right support institutions and individuals who have the necessary expertise to deal with the concerns.

As the farm business grows, effective communication becomes especially important to increase an understanding, cooperation and mutual trust. Some farmers find the transformation from a small informal business to a larger, more formal business structure daunting. Being used to hands on management of day-to-day operations and making all decisions, the agripreneur may find delegating of decision-making challenging. Extension should be geared to offer training programs where farmers are helped to become more aware and understand the transformations required (personal and business transformation). This will help farmers to prepare themselves emotionally, behaviourally and technically for the change process.

Lastly, extension is absolutely important to support farmers after completing entrepreneurship training programs. Entrepreneurship skills can be best learnt by doing. Learning happens through a process of discussion, acting (practise) and reflecting. This learning cycle equally applies for farmers when solving problems on the farm, and this process can sometimes be challenging which requires continuous support and guidance.

5. CONCLUSION

Behind each of the success stories of entrepreneurship there is usually some sort of institutional support. Besides the entrepreneurial spirit of an individual or group of individuals, the enabling environment supporting these initiatives is of utmost importance. The existence of such an environment largely depends on policies promoting entrepreneurship and the set of institutional support in place. The effectiveness of such policies depend on the conceptual framework about entrepreneurship (what it is and how to foster it), and a strong political will that entrepreneurial development is a strategic intervention for farmer development (with China and India as good examples to illustrate this point). Therefore it is absolutely essential that government and donors invest in infrastructure yes, but also in the set of institutions that are required to support agripreneurship.

Extension has a critical role to play in the fostering and development of agripreneurship. However, to be able to act in this direction, I believe we must be entrepreneurially minded. We must be able to see agricultural production as one of the factors contributing to the farm business.

Lastly, the agricultural environment has changed globally and also in South Africa, and the question is whether extension is willing to change the approach being practised for the last 22 years? We cannot be like a frog. You put a frog in a pot of water and when you turn on the stove it will not notice the temperature rising. We must guard against this tendency; we

cannot longer ignore the changes that are occurring in the agricultural environment. If we do, we shall wake up one day and find that we have been boiled!

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LESSONS LEARNT FROM A CAREER IN EXTENSION.

Stevens, J. B. (Ben)¹⁸

ABSTRACT

In this paper the author presented lessons from his career of 32 years as an Extension Officer and a Manager of Extension Staff. He described five (5) lessons as an Extension Officer and four (4) as a Manager. Each lesson is described in full and then summarised as a lesson to be learnt.

It is hoped that Extension Officers and Managers can both learn something that they can practice in their field of work and by so doing help farmers to be more successful and to produce more food for South Africa.

1. INTRODUCTION.

The author had a career of 32 years as Extension Officer and Manager of Extension Officers in the Department of Agriculture. He started as an Extension Officer fresh from the University of Pretoria with a BSc. Agric. (Animal Production) degree on 15 January 1975 at the Silverton Extension Ward in Pretoria. In 1976 he went to the Army for 1 year compulsory Military Service and in 1977 he went fulltime back to the University of Pretoria to do B. Inst. Agrar. (Hons) degree in Extension.

During 1976 he was placed with a more senior Extension Officer to gain practical experience in extension work. He was young full of knowledge and very eager to teach all the farmers how to farm. His actual extension work in the Ward only began in 1978 after the honours degree. The areas that he was responsible for were Pretoria, Johannesburg and the whole Witwatersrand from Springs to Krugersdorp.

In January 1991 he got a promotion to Assistant Director for the Magaliesberg Sub-region in Rustenburg. The Sub-region had three Ward Offices namely Brits, Rustenburg and Zeerust. There were 18 staff members in the Sub-region for which he was responsible.

After 1994 three districts of the former Bophuthatswana were added to his Sub-region. They were Moretele, Mankwe and Madikwe. In 1996 after the new provinces were established with their own departments, he became a Deputy Director at the Regional Office in the new Eastern Region of the Department of Agriculture in North West. The Regional Office was in Rustenburg. He held this position until his retirement in 2007.

The lessons learnt will be divided into two sections. The first section will be from the viewpoint of an Extension Officer and the second one from a Manager of Extension Officers.

2. PURPOSE OF THE PAPER.

¹⁸ Retired Extension Professional, Rustenburg, South Africa. Email: ben@sasae.co.za. ORCID: <http://orcid.org/0000-0001-9817-2035>.

The purpose of the paper was to identify the most valuable lessons from this career of 32 years and to present it in the paper. The number will of lessons in the actual presentation at the conference will depend on the time available for the presentation and the detail of the lessons. As much as possible detail will be given in the written paper.

3. METHODS / DATA SOURCES

The author looked back over his career of 32 years and made notes of the lessons he thought will be valuable for other Extension Officers and Managers to improve their service delivery to their clients (farmers and officers). The best lessons were then selected and described in the paper. The data sources were his records and reports from the 32 years of service. It will be like a desktop study or memoirs of his career.

4. RESULTS / DISCUSSION OF LESSONS LEARNT

4.1 Lessons learnt as Extension Officer.

4.1.1 New Extension Officer.

The ward where the author began his Extension Career was very big. It included all the magisterial districts of Pretoria, Springs, Brakpan, Benoni, Germiston, Kempton Park, Alberton, Johannesburg, Randburg, Roodepoort and Krugersdorp. Almost all the agricultural commodities that a farmer can farm with were in this ward. All types of farmers from commercial to small scale, from extensive cattle to intensive flower famers were present in the ward. There were a lot of small holder farmers or small holder owners especially around the towns and cities.

The first extension experience as a new officer with the senior officer he was placed with was a lesson on what not to do when an officer was placed with you for experiential training. The author was fresh from University an eager to teach farmers all this knowledge that he has. We were going for the first visit to a farmer - then we stopped at Jan Smuts Airport (as it was called those days, now O R Tambo Airport). The senior officer breeds with show pigeons and we went to the quarantine area to collect some exotic pigeons of him that he imported and which was kept in quarantine. Can you imagine his disappointment? He was however told on the way what the farmers in the area farm with as they drove to the airport.

The view of the senior officer was that you wait at the office for a farmer to call and then you go out to his farm to help with his problem. As the author discovered later in his Honours year this is a very small part of what extension is. Botha (undated: 3) said that giving advice as a form of extension is reactive in nature where the extension officer waits on the farmer to call and then the advice is given. He further said this is in contrast with what extension can be - Help towards self-help, reveals new insights, improves the quality of life, guides farmers, assists with decision-making, etc. Botha (undated: 11).

4.1.2 Full Extension Officer in the Silverton Ward.

After the Honours degree in extension the author understood what extension is and how to implement it. The first thing that he did from 1978 (after the Honours degree) was to do a reconnaissance survey to get an overview of what is going on in the ward. After that was established, a deeper full survey was conducted on the one area where the most progress could be made for farmers to improve their farming operations.

From the reconnaissance survey and practical experience at the office it was established that there are many queries from would-be farmers on small holdings. All of them wanted to know what they can do with their "farm". This was almost a fulltime job and a reactive one as the senior officer described. To sift the clients from those who just want to know to those who are serious to make an extra living he devised a plan to involve the farmers. The author and another Extension Officer at the office compiled a leaflet - Leaflet NR 145 - Production possibilities for the Small-holder in the Pretoria Witwatersrand area. In this leaflet they described the different production possibilities of the Ward and how to find out which is the best for their small holding. When there was a query the author sent the leaflet to the potential farmer and he/she was asked to dig profile holes in the areas they see as arable and if possible in the non-arable land as well. When they have done this they can call the office to make an appointment for a visit. By doing this more than 50% of the people who asked for the leaflets, did not come back to make an appointment for a visit. Only those who are serious to make an additional income from farming returned to make an appointment. This freed up valuable time of the officers to concentrate on extension.

The first lesson here is that an Extension Officer must first get to know his ward and the farmers through a reconnaissance survey. With these results he/she can plan what to do and where to concentrate to make the most progress for the farmers.

The second lesson is that an Extension Officer cannot avoid giving reactive advice, but he/she can plan it and do it in such a way that the farmer is involved in the process and it is not a one-way teaching experience, but an involved guiding and problem solving process.

4.1.3 Focus on a commodity.

The reconnaissance survey showed that there is potential under the deciduous fruit and pecan nut farmers of the ward to improve their production. There was a potential to form study groups and work with the farmers through study groups. It is more effective to work with groups than to work with individual farmers. Here it important to note that you have to visit individual farmers as well, but much can be accomplished through groups.

Another reason why the author chose to focus on deciduous fruit like peaches is that Stevens (1990: 7) quoted Krige (1965: 2) who said that farmers who specialise in some or other commodity (like the peaches in this case) have a greater common interest with the result that extension programmes that focus on such commodities have a greater chance of success. They will form more cohesive groups because they have the same interests.

The next lesson that the author wants to discuss is misperception and differential perception. While working with the peach farmers the author did a study to determine the information needs of the peach farmers. In lay terms perception is how you as an individual see a situation, how you belief the situation is. If you look at perception from the point of a farmer's application of the practices of his commodity (peaches in this case), then perception is how he / she sees how good or bad he / she implement those practices on his /her farm. Take one practice for example fertilization of the peach orchard. If you ask the farmer how his fertilisation programme is, he / she will tell you how much or how little he / she fertilise. You can then also ask what he / she think the optimum level of fertilisation is. The Extension Officer with his / her knowledge can determine what the real level of the farmer's fertilisation is and what the real optimum level is. With these measures you can draw a graph as in figure 1.

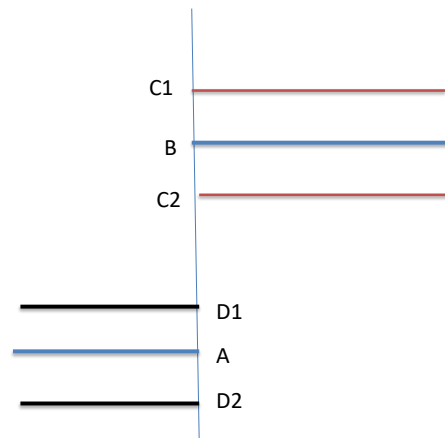


FIGURE 1: A simplified illustration of perceptions of the practice of fertilisation of peaches. (From Stevens, 1990: 10)

In Figure 1 Point A is the true level of fertilisation of the peaches by the farmer, while Point B is the true optimum level of fertilisation of peaches. Both points are as determined (measured) by the Extension Officer. The farmer sees himself at Point D1 or D2 for the level that he thinks he fertilises. That is the perception where he think he is. At D1 he thinks he is better than what he is and at D2 he thinks that he is weaker than what he really is. In the same way Point C1 and C2 is the perception of the farmer of the optimum level of fertilisation. It can be higher or lower than what it really is. In both cases he has a misperception of where he really is.

Why is this point important for the Extension Officer? It shows you the misperception of the farmer of his problem. He either overestimates his own level of fertilisation or underestimates it. The same with the desired level - he over- or underestimates it. This is called misperception on the side of the farmer and differential perception between the farmer and the Extension Officer. Most farmers (and ordinary people as well) overestimates their level of performance. So you as Extension Officer must know what the correct level is and you must measure where the farmer is. You must not guess it, measure it. You are firstly a scientist so you can measure. Then you will know if the farmer over or underestimates himself. This will help you to determine if the farmer have felt and unfelt needs. There are felt needs if he sees the application of his practice (fertilisation) lower than the optimum. The unfelt needs will be in the area of over- or underestimation. Then the Extension Officer can do an in-depth survey to determine why the farmer's perception is the way it is and what can he do to change it.

The third lesson is that the Extension Officer must know what perception and misperception is and how to determine or measure it and then how to change it.

4.1.4 Learning from Framers.

The author has majored in Animal Science and as described above he worked with peach and pecan farmers. How was that possible? The first thing is that he had the scientific

background of the four years of study. It was mainly about animals and pastures, but also a little bit of crops and horticulture. Fortunately most of the ARC research stations were in and around Pretoria where his ward was. So it was easily accessible and there was a good relationship between extension and Research.

The first thing that he did was to visit the Roodeplaat Vegetal and Ornamental Plant Research Institute to study the practices that the researchers said is the optimal for peaches. He visited the institute on a regular basis through the production cycle to get to know all the practices through the year.

At the same time he went to established commercial farmers that the reconnaissance survey showed and talked to the farmers about their practices. He asked them what they do, how they do it and why they do it. He then compared it to the optimum practices from the research institute. Because of the fact that the peach industry is very competitive the farmers did not tell him everything they do. They kept their secrets if they discovered to do it a certain way other farmers do not do.

There is a tool that you can use to determine what a farmer does. It is called a case study or practice study. It is a programme where you visit the farmer or group of farmers through the whole production season when each practice needs to be done. From the knowledge you gained at the research institute you know which practices need to be performed and how. With that list you visit the farmer and ask him what he did and you measure with him. For example when he thins out his peaches you look at how he does it and you count how many peaches are left per tree. When they are ripe, you go and pick with him, pack the boxes and count the number of boxes per tree and per hectare. This is the quickest way to learn a new commodity and to measure the commodity that you majored in. It is applicable to all the commodities. It is just the practices that differ, but the method is the same.

This is a very short description of what a case study or practice study is. The author is busy to write an in-depth booklet about the subject.

The fourth lesson is to learn how to do a practice study with the farmers to determine if they do their practices of the commodity correctly. To learn from the farmers with the farmers and then you will know how to correct their practices.

4.1.5 The skill of listening.

When you are fresh from university you think you have all the knowledge and you want to change the world and all the farmers. You want to increase every farmer's production to the optimum. You want to tell them everything even the things that they do not ask for. It is good to have the knowledge, but a more important skill you need is the skill to listen. To really listen to what they say and what they do not say verbally.

When you talk to a farmer the farmer must have your full attention. You must look at him, listen to what he says. Look at his body language, what he does with his hands. Can he look you back in the eye? You must not think of what you will answer him while he is talking or think of something else. Ask questions to clarify what you heard or to make sure you understood him correctly. Sometimes it is necessary to repeat what he said in other words so that he know you understood what he said.

It is a skill that you can learn if you do not do it correctly now. The important point is to listen attentively and to make the farmer feel he is the most important person at that moment. Your reaction to what the farmer say is also very important. What you say back and how you say it. When you see that a farmer is doing something wrong, you do not scold him and tell him how bad he is. There is a way to do it.

The last lesson form an Extension Officer's point of view is to develop your listening skills, to listen attentively when you talk to a farmer and to react in a proper way.

4.2 Lessons learnt as Manager of Extension Officers.

4.2.1 Know the area, farmers and officers.

Just as the Extension Officer must know his Extension Ward - the potential and commodities being farmed with, the Manager must know about the Wards of all the Extension Officers under him / her. He must also know about the farmers and their organisations. He must be involved with the farmers through their farmer's organisations. His involvement is however on a higher level as the Extension Officer - on a district level where the Extension Officer is on the local level.

After 1994 the author also learnt that there is a tribal Authority through which his Extension Officers and he must work. It is important to know how the hierarchy work.

The officers under your management are the most important of these three things that you as manager must know. The manager must find out what are the strengths and weaknesses of each officer. The manager must learn to see his officers in the same way he saw the farmers when he was an Extension Officer. The officers will also have perceptions and misperceptions on how they are performing their duties. The manager must measure them as he measured the farmer's practices.

Lesson 1 as Manager - know the area, farmers and officers that you are responsible for.

4.2.2 Visits to officers and farmers.

Lesson one stated that you must know the area, farmers and officers. The question is how? How is the manager going to learn about that? Certainly not by sitting behind his desk and computer. He must visit the offices. What the author sometimes did was to do a visit to an office early the morning, before the officer went out. Then you an opportunity to go out with the officer to the farmer and to observe what he does and how he does it. Show genuine interest in what they do. Observe, observe, observe.

The manager can also take part in the discussion with the farmer, but be careful not to take over. Remember the eager Extension Officer fresh from university who just wanted to share his knowledge with everyone. Some managers are the same. They long for those days where they interacted with the farmers. Remember they are not your farmers, they are the farmers of your officers. You can help them to help the farmers in the correct manner.

If you see during the visit that the officers do something wrong, do not scold them there in front of the farmers. Wait until you are back at the office and then reflect on the visit and what you observed. Strengthen and praise them for what they did right. Then point out where they could improve and how they should do it.

Lesson 2 as Manager - you must also measure your officers. You can only do that if you see what they do by visiting them and the farmers with them. Know how to praise and correct.

4.2.3 Listen to your Officers.

To be a manager is not very different from being an Extension Officer. You only have more to do. Just as the officer must learn the skill of listening, the manager must learn it as well (if he did not do so as officer).

The manager must listen to the officers the same way as they listen to the farmers - attentively, honestly, etc. Ask questions to understand what they tell you. There is however an extra area to listen to by your officers. You must also listen to what is going on at home in their private lives. It is important because if all is not well in their private lives, they cannot perform optimally at work. The good manager will observe the behaviour of the officer and know that something is wrong. When the officer do confide in you as manager on private problems, you must be very careful how you handle it. Confidentiality is of utmost importance. You may not talk about what your officer told you in confidence. The only exception is where you refer the officer for help.

Lesson 3 as Manager - develop your listening skills, to listen attentively when you talk to your officers and to react in a proper and confidential way.

4.2.4 Lead by example.

The Manager should not expect something from his officers that he as Manager cannot do. If you expect your officers to do a reconnaissance survey or an in-depth survey, you as manager must be able to help the officer in every aspect.

The author knows that many employers and managers may differ from him because they do not have the same qualification or experience as the officers. There is always a solution for a problem. It depends on your attitude - do you think you are the Boss and you know better or you can have an attitude that you are never too old to learn and it is not a shame to learn.

The manager should then apply the fourth lesson of the Extension Officer above. Learn from the officers who know and practice extension by measuring and observing in the same way the officers learn from the farmers.

The manager should also protect the extension officers in the work environment. It has become custom that the Extension Officer is the one you can send around with any task, whether it is related to the extension programme or not. The Professional registration of Extension Officers requires that they do extension work. If you as Manager and the Extension Officer have developed an extension programme for the area the officer is responsible for, then it is your duty as Manager to protect the officer against unreasonable demands.

Then you can be the "light in the front" for them and lead them by example, not only in extension, but in every aspect of the work and life. The Manager should remember it is not

about him it is about his officers. If they shine, then he will shine. The opposite is also true - if your officers fail, then you as manager fail.

Last lesson as Manager - lead by example; by building up; by measuring and observing; by protecting; and by having a positive attitude towards your officers.

5. CONCLUSION.

The author tried by presenting the lessons mention in this paper to share his experience with Extension Officers and Managers. It is hoped that they will learn from that and be able to apply it in their own working environment.

It is hoped that they will see it is possible to be successful in your work.

Remember whether you are an Extension Officer or a Manager - Do everything you do to your best ability as if you do it for God.

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THE INFLUENCE OF EXTENSION IN THE INTERNATIONAL ARENA WITH SPECIAL REFERENCE TO THE AFRICAN RENAISSANCE.

Zwane, E. M.¹⁹

ABSTRACT

This paper seeks to highlight that the establishment of three organizations in development both in the continent of Africa and beyond namely the New Partnership for Africa's Development (NEPAD, Africa Forum for Agricultural Advisory Services (AFAAS and the Global Forum for Rural Advisory Services (GFRAS) can be considered as the source of renaissance in agricultural advisory services. They have facilitated the development of enabling structures that have placed on records the plight of extension and advisory services. These organizations have brought hope among their clients, and initiated debate on the concept of extension. The importance of the concept of extension and Advisory Services (EAS) is discussed and it opened doors for marginalized farmers through the power of advocacy and has encouraged countries to adopt pro-poor approaches to farmer's development.

The paper adopts a literature study and consults relevant documents. The Findings are presented in narrative style which shows that there are different understandings of the concept of extension, and that extension is organized in sub regional networks linked to GFRAS, Africa Forum for agricultural Services (AFAAS), and NEPAD subprogram like Comprehensive African Agricultural Development Programme (CAADP). The paper indicates that GFRAS has developed learning materials which are downloadable from their website. Such information can help to strengthen the knowledge base needed to guide farmers' activities both globally and nationally. The paper concludes with some few recommendations such as using the learning materials developed by the organizations.

Key words: AFAAS, GFRAS, CAADP, Extension and Advisory services

1. INTRODUCTION

The establishment of three organizations in development arena both in the continent of Africa and beyond namely the New Partnership for Africa's Development (NEPAD, Africa Forum for Agricultural Advisory Services (AFAAS and the Global Forum for Rural Advisory Services (GFRAS) can be considered as the source of renaissance in agricultural advisory services. Their guidance and further development of enabling structures has helped to place on records the plight of extension and advisory services. Agricultural extension also known as agricultural advisory services plays a crucial role in promoting agricultural productivity, increasing food security, improving rural livelihoods and promoting agriculture as an engine of pro-poor economic growth. These objectives are also supported by other researchers (Davis, 2015; National Planning Commission, 2012). The use of the term has reformed due to its past misinterpretation like being a one way transfer of technology.

A new name for Extension is defined as systems that should facilitate the access of farmers, their organizations and other market actors to knowledge, information and technologies;

¹⁹ Deputy Director for Agricultural Extension based in Polokwane, Limpopo, South Africa. Email: zwane frank@gmail.com

facilitate their interaction with partners in research, education, agri-business, and other relevant institutions; and assist them to develop their own technical, organizational and management skills and practices(Christoplos, 2010). The reasons why it assumes this definition is the fact that it seek to include other role-players who operate and provide information and who may not be called extension. It is important that its potential be mobilized in order to broaden its impact within the complex systems of what Christoplos, 2010) calls “enhancing the broad and complex flow of information and advice in the agrifood sector” and others call it an innovation system (Daane, 2010).

There is no doubt that a lot has to be done in extension, to improve the livelihood of households for example, food security is one of the area of concern. Therefore this calls for an effective extension to achieve the objectives of development which include among others food security. It is argued that extension will only be effective if other services are in place, (Mollel, 2005), if research is focused on the problems facing farmers, if markets and land are accessible and if there is sufficient social, political and economic security in place to create an enabling environment for rural development (Christoplos, 2010).

2. OBJECTIVES OF THE PAPER

The problem investigated is the extent in which renaissance has played in bringing extension challenges back to the development agenda in order to influence development. This has been echoed by a number of authors (Mutimba, 2014), (Gfras 2008, and AFAAS, 2010). One of the outcome of the challenges why extension is acknowledged is the fact that in spite of huge budgetary efforts set aside by different countries for national and international development, there is still persistent rural poverty and global hunger (UN, 2015). Rural Advisory Services (RAS) are important institutions that can be used to achieve objectives of gfras, AFAAS and NEPAD due to the nature of the continental role they play in improving the livelihoods of rural people worldwide. According to Mutimba (2014), advisors are guilty of not documenting the impact of extension where they work hence many critics shout that there is no evidence, although in some areas extension has demonstrated positive impacts in spite of under-resourcing (GFRAS, 2008). In light of the fore going background the objectives of the paper are as follows:

To investigate how the RAS organizations are contributing to influence rural development.
To establish the role played by AFAAS, Gfras and CAADP as the agricultural developmental arm of NEPAD. And thirdly,
To document briefly the spread and links of AFAAS, CAADP and gfras in service delivery for extension advisors.

3. METHODS OF DATA SOURCES

Data was collected through literature review focusing on the relevant work done by organizations involved in renaissance such as the Forum for Agricultural Research in Africa (FARA), which has invested more resources in dissemination channels of their research results, Africa Forum for Agricultural Advisory Services (AFAAS), and the Global Forum for Rural Advisory Services (GFRAS), Extension Africa, and Southern Africa Regional Forum for Agricultural Services (SARFAAS). However they were not all utilized due to limited space in the paper. The information were analysed based on whether they contribute towards the attainment of the objectives of the paper.

4. RESULT AND DISCUSSION

The results discuss the main organizations that are relevant and influence both Extension and Advisory Services (EAS) and Rural Advisory Services (RAS) and are structured in terms of networks. These networks are presented in terms of their position in EAS, their mandate, achievements and the implication for extension and advisory services. Two forums organizations are discussed. The first organization is Africa Forum for agricultural Advisory Services (AFAAS) followed by the world wide forum called Global forum for rural advisory services (GFRAS) as well as linkages of sub regional networks and where they are located.

4.1 Continental organization of Extension: AFAAS

4.1.1 Background of AFAAS

The origin of AFAAS can be linked to the establishment of New Partnership for Africa's Development (NEPAD). NEPAD's origin comes from "The New Millennium for African Recovery Program"(MAP) which was proposed by President Mbeki of South Africa and Omega Plan proposed by President Wade of Senegal. Their plans were merged to form the New African Initiative (NAI). The latter name was changed on 23 October 2001 in Abuja, Nigeria, to New Partnership for Africa's Development (NEPAD). African Heads of States through their Implementation Committee, chaired by President Obasanjo of Nigeria, adopted the new plan, NEPAD (2002). Africa Forum for Agricultural Advisory Services (AFAAS) is a continental body. It has a partnership with NEPAD under Pillar (IV) of Comprehensive Africa Agriculture Development Programme (CAADP). AFAAS has the mandate to implement the Agricultural Advisory Services aspects of the Comprehensive Africa Agriculture Development Programme (CAADP) - an African-owned and Africa-led initiative through which interventions to Transform agriculture are coordinated (AFAAS, 2016).

4.1.2 History of AFAAS

The African Forum for Agricultural Advisory Services (AFAAS) was initially formed as the Sub-Saharan African Network on Agricultural Advisory Services (SSANAAS). The SSANAAS was created at the 1st Regional Networking Symposium on Innovations in AAS, held in Kampala, Uganda 11-14 October 2004. The initial member countries were Kenya, Malawi, Mali, Namibia, South Africa, Tanzania and Uganda. A second Symposium was held from 24-27 September 2006 in Kampala. It brought together the additional African countries of Eritrea, Ethiopia, Ghana, Mozambique, Nigeria, Rwanda, and Zambia; this brought the total of participating member African countries to fourteen. At this Symposium it was decided that the network should go beyond Sub-Saharan Africa (SSA) and embrace the whole of Africa. This necessitated the change of the name to the African Forum for Agricultural Advisory Services (AFAAS). The African Forum for Agricultural Advisory Services (AFAAS), was accordingly set up as the successor (and substitute for and permanent replacement) of SSANAAS, and AFAAS was legally established in Uganda as a NGO under the name African Forum for Agricultural Advisory Services (AFAAS) (AFAAS, 2015).

4.1.3 AFAAS's position in EAS

Like most organization AFAAS has developed a strategic plan to guide its activities. It has a vision, mission objectives and goals that seek to achieve its mandate. The Vision of AFAAS is: "Agricultural Advisory Services that effectively and efficiently contribute to sustained productivity and profitability and growth of African agriculture for poverty reduction". Its

mission is to “promote lesson learning and add value to initiatives in agricultural advisory services through sharing of information and increased professional interaction” As far as its goal is concerned, the purpose of AFAAS is: “ to have sufficient capacity in Agricultural Advisory services (AAS) to effectively support value chain actors towards increasing agricultural productivity and food security in a sustainable manner”. The goal is: “enhanced utilization of improved knowledge, technologies and innovations by agricultural value chain actors for improved productivity oriented their individual and national development objectives” The mandate is to: “implement the Agricultural Extension and Advisory Services aspects of the Comprehensive Africa Agriculture Development Programme (CAADP) - an Africa-owned and Africa-led initiative through which interventions to transform agriculture are coordinated” (AFAAS, 2016).

4.1.4 The influence of AFAAS and its achievements

Since its inception, in 2004 it has held Conferences and many achievements like: two extension weeks, one in Gaberone in 2013 and the other one in Ethiopia October 2015, Both themes can be summarized as seeking to support farmers with information and knowledge as well as capacitating the Extension advisors to help farmers better, Judged from their themes one can realize the contribution it has made in Rural advisory services. The conferences held by AFAAS one held in Uganda 2004 and Ghana in 2010, discussed critical areas of intervention in an attempt to strengthen Extension and Advisory Services(EAS).

The areas were Policy within CAADP, Information Communication (ICT), Value chain, Gender mainstreaming, and climate change. These focus areas were re-branded with times to include advocacy and extension forums. AFAAS is operating in more than 40 countries in Africa and has facilitated in the establishment of Agricultural extension forums which can be seen as vehicle in attempting to drive EAS towards professionalization. Furthermore AFAAS has commissioned the establishment of documents that has made extension information available to support extension and advisory practices. Some of the information include: FAAP principles, Guide to Extension Forums,

4.2 Comprehensive African Agricultural Development Programme (CAADP)

CAADP’s genesis can be traced from NEPAD as well as from the Forum for Agricultural Research in Africa (FARA) FARA, the Forum for Agricultural Research in Africa, was formed in 2001 as a facilitating and information exchange forum among sub-regional research organisations (SRO)s, and as an apex body to represent SROs. FARA has since become the lead agency for CAADP pillar 4 (agricultural research and dissemination), working together with AFAAS (the African Forum for Agricultural Advisory Services, see section below). FARA aims to achieve ‘sustainable improvements to broad-based agricultural productivity, competitiveness and markets’ through five Networking Support Functions. Both FARA and the (SROs) are committed to using the Framework for African Agricultural Productivity (FAAP) and its nine principles to guide all their activities. FAAP principle 5 asks specifically for an ‘integration of agricultural research with extension services, the private sector, training, capacity building, and education program (Adolph, 2010).

The Forum for Agricultural Research in Africa (FARA) is the apex continental organization responsible for coordinating Agricultural Research for Development (AR4D) in Africa so as to increase its efficiency and effectiveness. It serves as the entry point for agricultural

research initiatives designed to have a continental reach or a sub-continental reach spanning more than one sub region.

The African Heads of States and Governments declared 2014 to be the Year of Agriculture and Food Security in Africa. It marked the 10th anniversary of the adoption of the Comprehensive African Agriculture Development Programme (CAADP) by the African Union (AU) and the New Partnership for Africa's Development (NEPAD). It also marked the AU's adoption of the Malabo Declaration on Accelerated African Agricultural Growth and Transformation (3AGT) (FARA, 2015).

FARA serves as the technical arm of the African Union Commission (AUC) on matters concerning agricultural science, technology and innovation. It provides a continental forum for stakeholders in Agricultural Research for Development (AR4D) to shape the vision and agenda for the sector and to mobilize themselves to respond to key continent-wide development frameworks, notably the Comprehensive African Agriculture Development Programme (CAADP) of the African Union (AU) and the New Partnership for Africa's Development (NEPAD) (FARA, 2015).

4.2.1 The Sub regional arrangements of extension organization

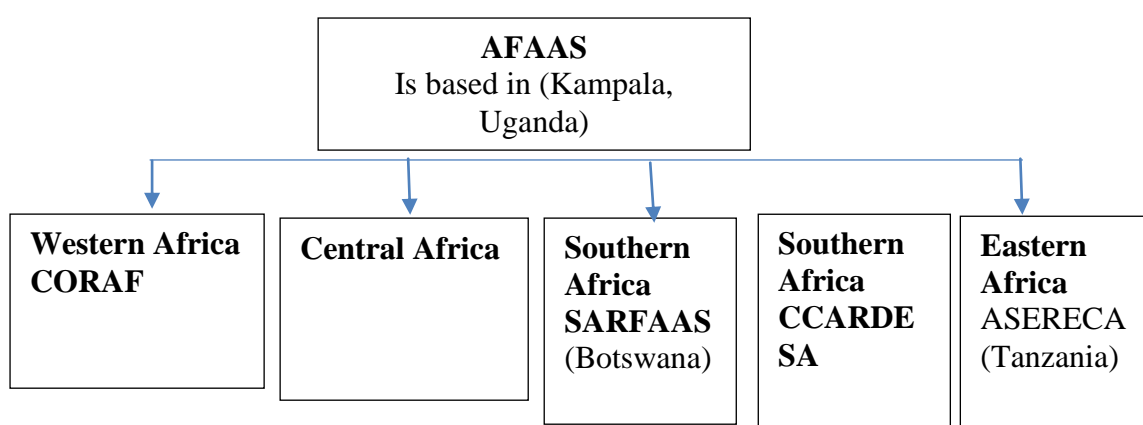


Figure 1. Sub regional organizations collaborating with AFAAS
Source (own, 2016)

AFAAS is working hand in hand with the sub regional formations based in the West, central, Southern and Eastern part of Africa. There are both research organizations such as the following: (National Agricultural Research Systems) other than National Agricultural Research Institute (NARIs). The study showed that there are Currently there are four sub regional research Organization (SROs) in Africa: West and Central African Council for Agricultural Research and Development (CORAF/WE CARD), formed in 1987, with 22 West and Central African National Agricultural Research System (NARS) members; Association for Strengthening Agricultural Research in Eastern Africa (ASARECA), formed in 1993, with 10 East and Central African National Agricultural Research System(NARS) members; South African Development Community (SADC) Food, Agriculture and Natural Resources (FANR), formed in 2001, with 14 Southern African NARS members; and in 2004 Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA) was formed, North Africa Sub-Regional Organisation (NASRO), formed in 2009, with 6 North African NARS members(FARA, 2015).

There are also academic institutions under the umbrella of Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) which also work with AFAAS. One important southern Africa sub regional body was formed in 2015 and is called Southern Africa Forum for Agricultural Advisory Services (SARFAAS). The mandate of these sub regional bodies differs but in the final analysis they strive to promote the improvement in reaching farmers from different angles (Adolph, 2010).

4.3 Global Forum for Rural Advisory Services (GFRAS)

4.3.1 *The background of GFRAS*

GFRAS is working on five objectives namely to provide a voice for advisory services within global policy dialogues convening, mobilizing, energising, and harmonising within the broader agricultural development arena to support the development and synthesis of evidence-based approaches and policies for improving the effectiveness of Rural Advisory Services (RAS); to facilitate interaction and networking for individual, organisational, and institutional capacity strengthening in RAS; and to promote the creation of an enabling environment for improved investment in RAS (Adolph, 2010).

4.3.2 *The history of GFRAS*

The Global Forum for Rural Advisory Services (GFRAS) was created in January 2010, to provide a space for advocacy and leadership on pluralistic, demand-driven rural advisory services within the global development agenda (GFRAS, 2004). According to history it emerged from African Forum for Agricultural Advisory Services (AFAAS) experience. The ultimate goal of GFRAS is to contribute to elevation of hunger and poverty worldwide. The GFRAS role fulfils an important missing gap in the rural development arena. GFRAS provides space for RAS and rural development actors to advocate for and lead on advisory service issues. The Forum plays a catalysing role, promoting and stimulating interactions between and within the global level, and the regional and national levels.

4.3.3 *The Position of GFRAS in EAS*

The GFRAS mission is to provide space for advocacy and leadership for rural advisory services that are pluralistic and demand-driven, in order to promote sustainable rural growth and help the poor. This is so because since 1980 the focus on extension and rural advisory services has fluctuated widely on the agendas of governments, program planners, and donors in the past. In the 1980s there was much support and attention given to extension, which subsequently waned until recently. In spite of under-resourcing, extension has continued to give high rates of return and had significant and positive effects on knowledge, adoption, income, and productivity in many cases (GFRAS, 2008).

4.3.4 *Influence of extension world wide*

The purpose of GFRAS is to provide a space for advocacy and leadership on pluralistic, demand-driven rural advisory services within the global development agenda that promote sustainable rural growth and help the poor. This will contribute to the ultimate goal of reducing hunger and poverty worldwide. In the long term, the forum's objectives are to: a). provide a voice for advisory services within global policy dialogues (convening, mobilising, energizing, and harmonising within the broader agricultural development arena); b). Support

the development and synthesis of evidence-based approaches and policies for improving the effectiveness of rural advisory services (RAS); c). Facilitate interaction and networking for individual, organisational, and institutional capacity strengthening in RAS; and d). Promote the creation of an enabling environment for improved investment. There are six continental networks of RAS facilitated by GFRAS and are depicted in Figure 2.

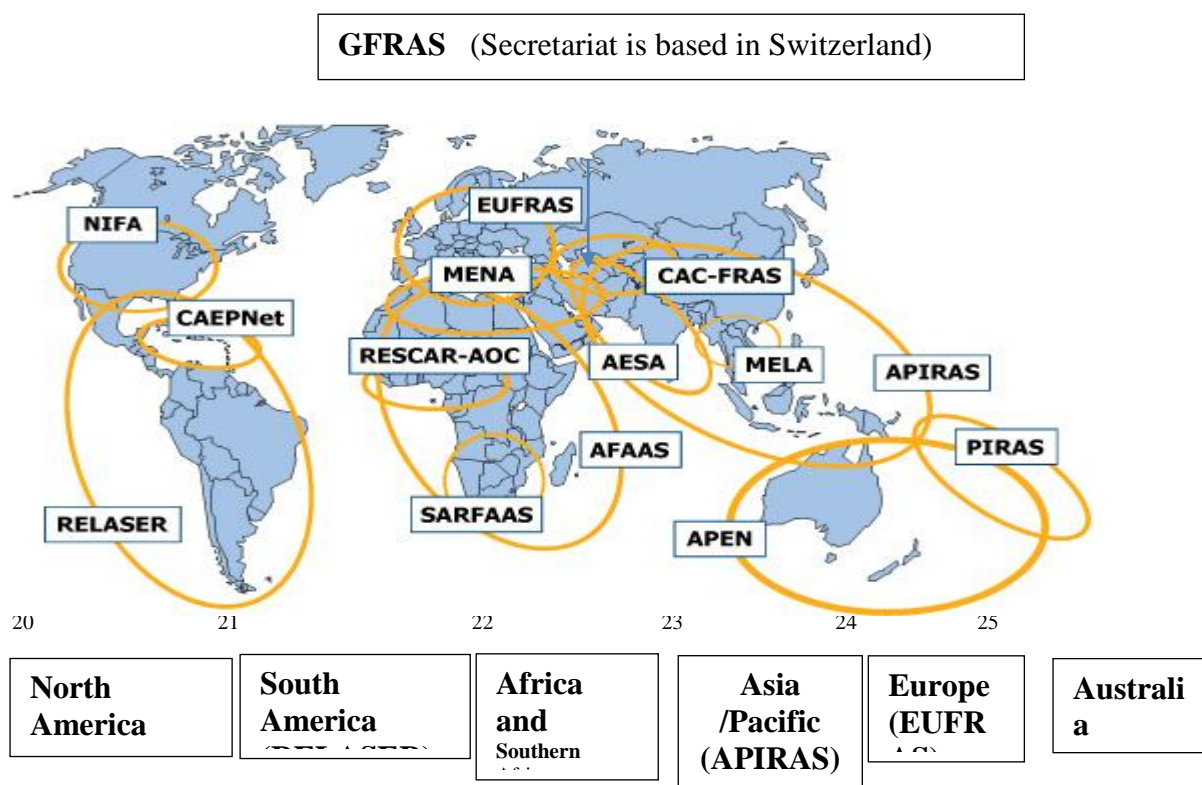


Figure 2. GFRAS Worldwide Networks (adapted by author)

4.3.5 Asia and Pacific

The Pacific Islands Extension Network (PIEN) was formed in 2005, primarily with the aim of building the capacity of extension staff and associated institutions including government, non-government and academic institutions in participatory research and extension. The academic network working with PIEN is called Asia Pacific Association of Educators on Agriculture and Environment (APEAEN). APEAEN is the largest network of professionals working in agricultural education in the region, with 21 member countries and a large number of individual members. Their mandate is mainly scientific and technical capacity development and exchange between members.

The Asia and Pacific region is very heterogeneous, with a wide variation in agro-climatic zones and biodiversity, levels of economic development, social infrastructure, human wellbeing, and the capacity to respond to disasters and crises. Industrialised countries of the

²⁰ NIFA = National Institute of Food and Agriculture

²¹ RELASER= Latin American regional network for rural extension

²² AFAAS= African Forum for Agricultural Advisory Services

²³ APIRAS=Asia Asia-Pacific Islands Rural Advisory Services Network

²⁴ EUFRAS= European Forum for Agricultural and Rural Services

²⁵ APEN= ASIA pacific Extension Network

region have achieved high levels of well-being and are recognised as new centres of manufacturing, with the result that East and South Asia now account for a major share of world economic output and economic growth (Adolph, 2010).

The Green Revolution launched in the region in the 1960s resulted in an unprecedented growth of agricultural production and productivity, and led to more than halving the proportion of hungry people by the year 1995 (Adolph, 2010). For the past decade or so, the region (with the exception of China) has experienced stagnation or slowdown in agricultural production and productivity. Food insecurity and poverty, particularly rural poverty, accounting for two thirds of the world's hungry and poor, exacerbated by the soaring food and fuel prices, global economic downturn, volatile markets, and climate change-induced vulnerability, have resurfaced as the foremost development concerns in the region, resulting in an increasing divide between rural-urban and farmer-non-farmer incomes (Adolph, 2010). The Australasia-Pacific Extension Network (APEN) is a professional association with around 500 members, mostly based in Australia. The Pacific Islands Extension Network (PIEN) was formed in 2005, primarily with the aim of building the capacity of extension staff and associated institutions including government, non-government and academic institutions in participatory research and extension (Adolph, 2010).

There are three main agricultural research networks covering the Asia and Pacific region: AARINENA, established in 1985, covering Western Asia (including Pakistan) and the Arabian peninsula, APAARI, established in 1990, covering 42 countries in South, South East (SE), and East Asia, and the Pacific (including Australia and New Zealand), CACAARI, established in 2009, with eight members (all former Soviet republics) (Adolph, 2010). In the Pacific, GFRAS collaborates with the Pacific Islands Extension Network (PIEN) In Europe, GFRAS includes the European Platform for the Chambers of Agriculture and Advisory Services.

4.3.6 Latin America and Caribbean,(RELASER) and Asia-Pacific Islands Rural Advisory Services Network (APIRAS)

GFRAS work with both of these networks however the study has found that Capacity strengthening is a major issue in all regions of the world for rural advisory services. Capacity strengthening was started as a working group led by the Latin American regional network for rural extension (RELASER), with support from the Asia-Pacific Islands Rural Advisory Services Network (APIRAS). Whereas in Europe it was found that there is no formal network on RAS covering the whole of Europe.

The International Academy for Agricultural and Home Economics Advisory Services (IALB) is a platform for German-speaking RAS that fosters exchange of information and experiences. Participants of the 49th IALB conference in Besancon mentioned the need to intensify and enlarge the European exchange on RAS to benefit from Europe's diverse experience.

4.4 Achievements of GFRAS world wide

GFRAS holds an annual meeting for its members and affiliates in the AAS community. The annual meeting is the central GFRAS event for experience exchange and to discuss strategic directions. GFRAS working groups are composed of a group of GFRAS affiliates or members actively working around a thematic topic, usually across regions and organisations.

They are formed on a demand-driven basis and with the direction of the GFRAS steering committee.

GFRAS has managed to commission a number of studies which has made extension information available for reference like debating on a number of issues such as mobilizing extension, evaluation of advisory services, a synthesis report of RAS, world wide database of EAS, good practice notes for Value chain, Farmer to farmer extension and others. It has organized GFRAS annual meeting in which papers were presented. Since its inception from 2010, GFRAS has held 6 annual meetings in the following countries; in Chile in 2010, Kenya in 2011, Chile in 2012, Philippines in 2013, Buenos Aires in 2014 and Kyrgyzstan in 2015. The 7th meeting will be held in Cameroon in September of 2016.

5. DISCUSSION OF THE FINDINGS

5.1 Global Forum for Rural Advisory Services (GFRAS)

GFRAS is about enhancing the performance of advisory services so that they can better serve farm families and rural producers, thus contributing to improved livelihoods in rural areas and the sustainable reduction of hunger and poverty. Its mission is to provide advocacy and leadership on pluralistic and demand-driven rural advisory services for sustainable development (GFRAS, 2010). GFRAS plays a catalysing role, promoting and stimulating interactions between and within the global policy level and the regional and national levels.

This space allows regional actors to present their perspectives in global development forums and processes. It also supports the development, exchange, and diffusion of tried and tested extension approaches, tools, and policies and stimulates institutional and individual capacity development. Several donors' support GFRAS and it is guided by a steering committee with members drawn from the regional networks and other international development agencies. The GFRAS secretariat, led by the executive secretary, is responsible for implementation of the GFRAS strategy and work plans under the guidance of the steering committee (Adolph, 2010).

5.2 African Forum for Agricultural Advisory Services (AFAAS)

The African Forum for Agricultural Advisory Services (AFAAS) is the umbrella organisation for Agricultural Extension and Advisory Services (AEAS) in Africa. Its objective is to create efficient, effective and synergistic linkages and partnerships between AEAS of member countries to improve the delivery of these services to farmers. It operates within the framework of the Comprehensive Africa Agriculture Development Programme (CAADP), specifically CAADP Pillar IV which has the objective of enhancing the livelihoods of African farmers and pastoralists.

The Forum for Agricultural Research in Africa (FARA) has been mandated to lead the implementation of CAADP Pillar 4 and it is in this context that AFAAS has strong collaboration with FARA and the Sub Regional Research Organizations (SRO). As already indicated it operates in more than 40 African countries, including South Africa. Their members have participated in the Task force which assisted in the development of the South African Extension policy.

5.3 Meeting the objectives of the paper

In line with the three objectives of the paper, information revealed how the objectives were reached. For example the paper has explored the three organizations AFAAS, CAADP, and GFRAS and indicated how they were established, their objectives, their missions and went on to show which sub regional networks are linked to them. The mode of operation was also highlighted.

6. CONCLUSION AND RECOMMENDATIONS

It can be stated that both the two international bodies namely AFAAS and GFRAS have played a crucial roles in bringing a renewed name of extension and advisory services (EAS), as well as the Rural Advisory Services (RAS), back in the spot light. This has rekindled the lost enthusiasm among extension practitioners and their supporters for a new hope in rural development. There is new hope in the profession of extension and advisory services due to this intervention. Furthermore through their advocacy spirit, the three organizations made efforts to engage countries who adopted pro-poor approaches to farmer's development, which for years were left behind. It can be reported that Both AFAAS and its sub regional bodies and GFRAS and its sub regional networks have strong interest to serve extension and advisory services in Africa, and in the world.

6.1 Recommendation

Based on the findings of the paper it is recommended that:

- Comprehensive Africa Agricultural Development Programme (CAADP) process in Africa should be supported because it is the source of advisory services. It has provided an opportunity to bring agricultural development back on the agenda both in Africa and in other continents.
- There should be coordinated approaches at country level with a clear role for both generation of knowledge and technology and agricultural advisory services.
- Challenges should be acknowledged and all RAS and EAS should be prepared to work towards the solution.
- Relevant documents that support advisory services need to be accessed from the relevant websites of the three organizations viz. NEPAD, (CAADP), AFAAS, and GFRAS for the best fit.
- Various positive extension approaches which have been developed together with elements of value chain by the three foregoing organizations should be promoted.

In conclusion it should be noted that GFRAS and AFAAS's role in the regions where they operate provide networking and learning opportunities, so that the different stakeholders active in RAS have the opportunity to learn from each other (Adolph, 2010). The globalization of practices will assist in fighting our common challenges of food security which is needed to feed the estimated billions of people in future. While Africa can be seen as a gate way to the world and it can also be seen as a gate way from the world to Africa.

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PROGRAMMED EXTENSION IN PRACTICE: THE LIVESTOCK COMMODITY SUPPORT PROGRAMME TO DEVELOPMENT FARMERS IN THE WESTERN CAPE, EDEN DISTRICT; METHODOLOGY AND RESULTS.

Grobler, H. J. F.²⁶

ABSTRACT

Departmental support to small holder farmers in the Western Cape has been strengthened by forming partnerships with commodity organizations. Commodity Project Allocation Committees employ technical teams to evaluate projects and business plans, and to make informed decisions on approval and funding of projects. District Commodity Work Teams have also been formed to develop support strategies to the sector to ensure sustainable development. The Eden district's Red Meat Development Forum has developed and implemented a support programme to livestock farmers with measurable objectives, based on a comprehensive baseline survey. The developed framework for the Support Programme includes 1) guidance in land acquisition, 2) project planning and implementation, 3) yearly baseline audits, 4) support and extension and 5) norms development as the components. Thirty projects in the Eden district participated in the program over seven years, since 2010. Commercial control farmers per enterprise are also evaluated as a reference on achievement. Measurable success in management, use of management information systems, and quality of breeding stock, production and gross margins were achieved.

Keywords: Livestock, support, monitor, evaluation, development, extension science.

1. INTRODUCTION

It appears that the application of extension science in the field, through a programmed approach, as an essential methodology towards agricultural development, struggles to get established. The danger of randomised training and visits, as well as other good intentioned performance targets, tend to scatter good effort and may work against agricultural growth and development. Too much emphasis on project establishment i.e. farm development, although of crucial importance in land reform, tends to neglect the main task of extension, which is continual human capital development and support.

A programmed approach to the development of land reform livestock projects in the Eden district of the Western Cape, has been followed since 2010. The purpose of this paper is to present the methodology followed, with some results achieved, of a programmed support approach as an example for extension practice.

2. METHODOLOGY/Framework

Departmental support to development farmers in the Western Cape has been strengthened to form partnerships with Commodity organisations. Commodity Provincial Allocation Committees employ technical teams to evaluate projects and business plans so as to make informed decisions on approval and funding of projects. The Eden District Commodity

²⁶ Livestock specialist, Eden District; ' Farmer Support and Development, Western Cape Department of Agriculture, manieg@elsenburg.com.

Development Forum (Livestock) has been formed to develop support strategies to the sector to ensure sustainable development. The Eden district's Livestock Development Forum has developed and implemented a support programme to livestock farmers, with measurable objectives, based on a comprehensive annual baseline survey (figure 1). The developed framework for the Support Programme includes 1) guidance in land acquisition, 2) project planning and implementation, 3) yearly baseline audits, 4) support and extension and 5) norms development as the components. The process is diagrammatically presented in figure 1. Projects are identified by a letter (A, B,...). Components of the process as discussed below are identified by encircled figures (1, 2,...). Each newly established project will be incorporated within the structured scheduled process where the yearly evaluation becomes the specific project's first baseline.

The multidisciplinary nature of the process necessitates the involvement and coordination of several programs and subprograms of the Department of Agriculture, the Department of Rural Development and Land Reform and Private organizations and companies (Red Meat Producers' Organisation-RPO, Nelson Mandela Metropolitan University-NMMU, NWGA, BKB, CMW as well as commercial and stud farmers).

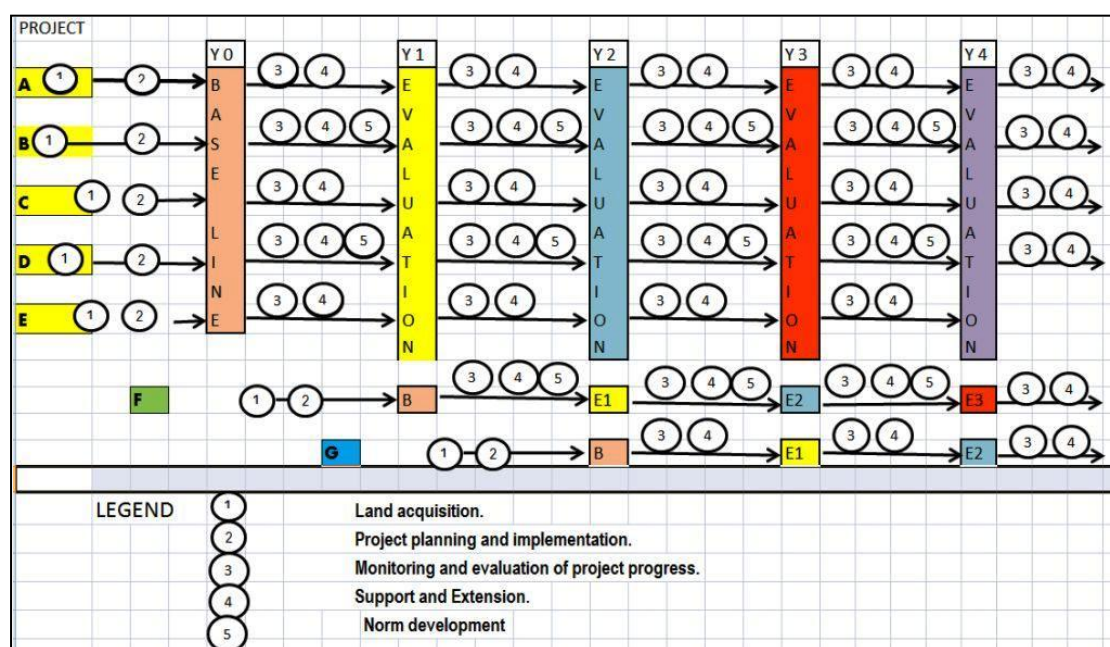


Figure 1. Diagram representing the process of the Eden Districts' Livestock Support Program to new and participating projects (Grobler, 2011).

1) Land acquisition.

Farms have been acquired through different processes; individually either through private sale or lease agreement; or through the LRAD (now discontinued) or PLAS programmes of the Department of Rural Development and Land Reform. Members of the work team aim to be involved in the planning and evaluation of projects as early as possible. This is however not the main focus of the Support program.

2) Project planning and implementation.

Once land has been acquired, comprehensive business plans per project are compiled, evaluating resource and economical sustainability. Implementation of proposed farm systems are executed over scheduled time periods, keeping track through recording and

evaluation of the farm's development needs, especially infrastructural development (in the initial stages), as well as the knowledge base and managerial level of beneficiaries.

3) Monitoring and evaluation of project progress (progressing baseline).

Continuous monitoring and evaluation are initiated by a baseline survey. The survey includes practical monitoring of livestock on production, reproduction and health of beef herds and small stock flocks. This is followed up with a comprehensive interview questionnaire auditing knowledge, practical application of best practices, human aspirations as well as inputs and marketing of the previous year, to calculate enterprise economic achievement. Categories monitored and assessed are:

- a. Beneficiary social information, perceptions on social structures, vision, and strategic thinking.
- b. Farm infrastructure: type, quantity, quality and monetary value.
- c. Equipment: type, quantity, quality & monetary value.
- d. Production capital in terms of stock, animals and monetary value.
- e. Management information systems use and efficiency.
- f. Animals: Age, type, herd structure and fibre.
- g. Biological production, health and efficiency measures.
- h. Current management practices, knowledge and application of best practices (figure).
- i. Economic and financial status of the different enterprises and farm as a whole.

Projects are monitored continuously by scheduled visits. Adhering to the implementation plan and record keeping is encouraged. Biological production measurements are carried out and analyzed (e.g. regular livestock weighing based on performance measurement guidelines). Animal health is evaluated as well as economical or financial recording through the SIMFINI, FRK financial recording program run by the Production Economics sub-programme of the department.

The baseline survey identifies limitations and developmental opportunities per project. This is built into an extension/development approach for future support. The audit survey is repeated annually to monitor progress and amending benchmarks.

Commercial farms with comparable resources and enterprises are identified and surveyed simultaneously to serve as a measure of progress, comparing systems and setting of goal benchmarks.

4) Support and Extension.

The annual evaluation and follow-up surveys and monitoring are used to identify problem areas and limitations to progress. From these evaluations a support programme is drafted to focus on remedial and development support in a structured holistic framework. The aim is to channel all advice, mentoring, training and other support efforts by the WCDoA (Western Cape Department of Agriculture) and partners through this programme to focus effort and reduce confusion amongst developing farmers that may result from uncoordinated efforts. Thus, a district (combined) and project specific extension support program is compiled and executed.

The annual progressing baseline findings are reported back to farmers at a scheduled feedback event. Limitations, growth potential, comparisons and the new support program for the following year are discussed.

Execution of the extension support program then runs simultaneously with continued monitoring and evaluation. The following year's monitoring and evaluation becomes the new baseline and the support program adjusted to the new findings. The support program endeavours to include all possible extension channels to achieve change, including, training and visit of individual projects, group dynamics, exposure to the industry and best practices, arranging and participation in competitions and employing progressing farmers as agents for change.

Since 2010, thirty small stock, beef and/or calf rear projects have been included in the program.

5) Norms' development and research.

The need for planning norms, on-farm or through experimental farm research are identified through this process and channeled to the appropriate Programs and/or organizations for investigation and establishment of norms and building sustainable systems adapting project enterprises and used to build into new projects.

All generated data and maps are electronically stored in an organized database for future use by management and for planning and advice.

The Livestock Development Forum focuses on commodity approved projects, expanding to identified best practice commercial farms, within project homogeneous farming areas, as an expansion of support to the commercial sector.

3. RESULTS AND DISCUSSION

The support program was initiated in the Eden district since 2010. Development initiatives that resulted from this initiative since the commencement of the program include the following:

1. Bull project. Bulls bred at departmental research centres are made available to projects through a lease agreement,
2. Heifer project. An initiative with the Tuli Breeders' Society in distributing pregnant Tuli heifers to projects with a return of the same number of heifers after five years to support other projects.
3. Veldram project. Projects are supported in purchasing of veld tested rams,
4. Calf rear programme:
 - a. Making AngusxJersey calves bred at the Outeniqua research station available to calf rearers at a subsidised price,
 - b. A phased calf rear program initiative in collaboration with the private sector in supporting calf rearers in different phases of raising and growth.
5. Annual Small stock show with young ewe and carcass competitions (since 2010; 70 participating projects in 2016).
6. Annual performance show and competition for small and large stock (since 2014).
7. Performance testing for projects and project performance competitions. Competitions are held annually for categories on record keeping, best achievements in different enterprises as well as farm economy.

Thirty projects participated since 2010 in the program with one control/reference farm for each enterprise. Enterprises evaluated include Mutton and Wool sheep, Boer goats, Angora, beef and Calf rear.

Results achieved include:

Improvement in knowledge of livestock norms, industry standards and practices (Figure 2).

Farmer evaluation on knowledge and efficient management

	GD	BH	ZRS	RFT	SB	TKL	MD	NT	ZR	PP	KM	ARK	MK	OPP
RECORDS														
Rain recording														
Flocks on the farm	1	1	1	1		1						1		
Herds on the farm	1			1	1	1	1	1			1		1	
Pasture & potential														
Grazing camps needed per flock	9	15		4	6	6					6	4	5	
Camps on the farm	?	15	6	7	6	12	14				6	4		
Camps available/flockherd on the farm	4.5	15	6	3.5	6	6	14		4.3		6			
to 3	30-35	?	50	50	10	35-40					15-20	40	30	
Replacement														
Ram use per flock (yrs)	4	?	4	5								2		
Bull use per herd (yrs)					2	1.5					2		2to3	

Surveyed item

Knowledge response

Application response

Calculation/analyses

Tabled Response

Commendable

Cause for concern

Alarming, immediate intervention needed.

Figure 2: Examples of Farmer knowledge, practices and perceptions surveyed.

1. Adaptation of managerial information systems (keeping of basic records (60% of projects involved), with 20% keeping more advanced livestock records).
2. Improvement of breeding stock quality:
 - a. Improvement is evaluated by breed judges at annual livestock shows and competitions since 2010,
 - b. Purchasing of breeding stock on estimated breeding values and Veldram tested sales (six beef projects, five small stock projects).
3. Improvement in marketability of livestock products:
 - a. Improved efficiency through advance in reproduction (Table 1 serves as an example in beef projects),
 - b. Improved productivity through crossbreeding (Table 2 and 3 presents results achieved in introduced crossbreeding with indigenous cattle). The combined profitability of small stock projects shows a sharp decline in profitability in 2014/15. Factors influencing this are substantial losses due to predation and prevailing drought conditions in the Klein Karoo.

Table 1. Cow performance: 2011 to 2014

	Project 1			Project 2	Project 3	Reference farms
	ICP 2011-2012	ICP 2012 - 2013	ICP 2013 - 2014	ICP 2013-14		ICP 2013-14
Herd average ICP	344	339	337	411		422
Calving percentage	100	100	100	88	100	83
Weaning percentage	100	100	100		100	

Table 2. Improvement in weaning weights (205 days) due to cross breeding, 2014/15:

Breed	Indigenous Small frame	Indigenous cross	Indigenous Med frame	CompositeX Mixed ind.
Project				
P1	144	173	184	
P2				187
P3	184		185	

Table 3. Income possible according to breed of weaners offered (2015)

Breed	Price Received Per kg	per calf R	Number From 10 cows	R/Farm
Indigenous Medium frame	R19.00	3489.368	8	27914.94
Indigenous cross	R15.00	2587.302	10	25873.02
Indigenous Small frame	R11.00	1581.526	10	15815.26

4. A resulting progress in project economy: Combined profitability trends from 2011 to 2015 are presented for beef projects in figure 3 and small stock in figure 4 (Jordaan, 2015).

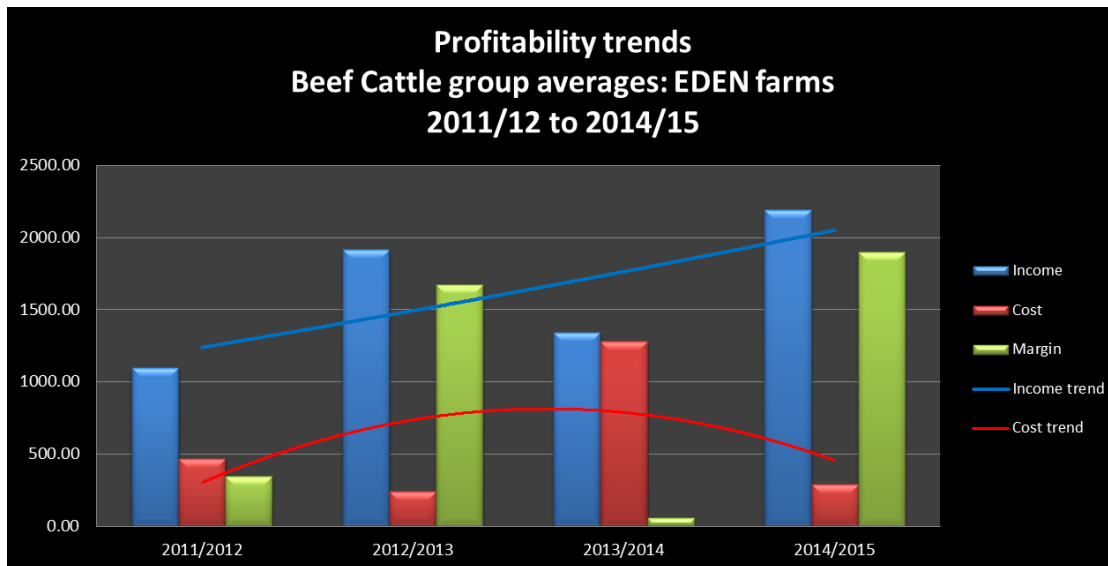


Figure 3. Combined beef project profitability trends for Eden district, 2011 to 2015 (Jordaan, 2015).

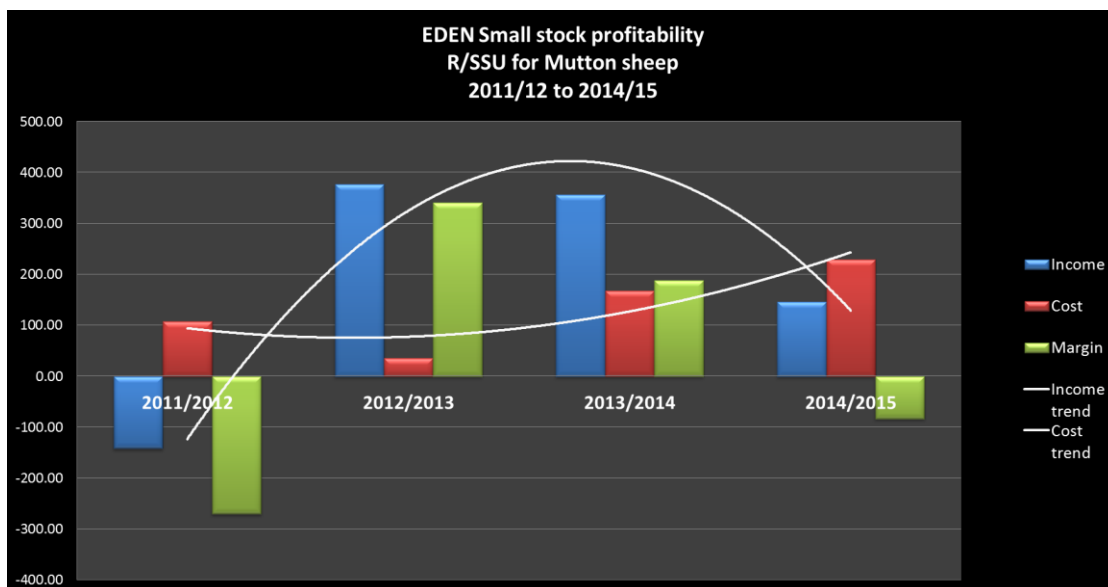


Figure 4. Combined small stock project profitability trends for Eden district, 2011 to 2015 (Jordaan, 2015).

Although substantial progress has been made the following limitations still exist and need to be addressed;

1. Most farmers still have vague or unrealistic visions for development of their farming enterprise, with limited plans on how to achieve these visions,
2. There is a general over-estimation of the potential of the natural resources and it's limitations, resulting in over-utilisation of resources,
3. Economy of scale. Due to high cost of land, most land reform projects have been established on sub-economical farm units by programmes of the Department of Rural Development and Land Reform. This results in farm units that struggle to support overhead costs which will limit progress and future profitability.

4. CONCLUSIONS AND EXTENSION IMPLICATIONS

A programmed developmental approach ensures a more focussed and efficient methodology for achievement of the objectives of the National Development Plan. The approach ensures the:

1. Establishment of a detailed measurable base to focus on key project deliverables, pinpointing exactly the focus areas for each project,
2. Continuous assessment to ensure timely intervention programmes,
3. Nurturing projects through a process of growth to independence,
4. Farmer introduction, entrance and participation into the existing larger agricultural industry,
5. Multi -disciplinary and –organisational cooperation and coordination to form a scheduled farm(er) development network,
6. Optimal production for national food security,
7. Continuity and adaptation of extension effort and approach.

Project results achieved from the implementation of the Livestock Support Process indicate an extension methodology providing positive results towards farmer development and food security. With adaptation to specific area, enterprise and demographic circumstances the promotion of this methodology to other Districts and provinces may be encouraged.

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SELF-EFFICACY: SOURCES, PHYSIOGNOMIES, GOAL REALISATION AND IMPLICATION FOR EXTENSION.

Agholor, A. I.²⁷

ABSTRACT

The delivery of quality extension services remains one of the focal issues in the contemporary extension policy discourse. The awareness, attitudes and values which an individual holds about his abilities affects his work performance. The pessimistic perception and negative comments about quality extension service delivery has been on-going but little has been done to evaluate the concept of self-efficacy in extension practice. Self-efficacy describes an important facet of human motivation which denotes a positive self-prophecy about ones capabilities premised on oriented outcomes, relayed experiences and verbal inducement. The primary step for extension to succeed with farmers will be to acquire the perception and vehemently exert control over outcomes associated with new innovations. There are plethora of evidence that emanated from various studies to show that it is possible to increase Extension self-efficacy by applying techniques such as skill building, evaluation of performance, behavioural modelling practice, motivation, and experiential education. The paper discusses the sources, physiognomies, goal realisation and implications of self-efficacy in the context of Extension service delivery. The paper concluded that with increase in self-motivation, there is a concomitant growth in self-efficacy. Extension practitioners are likely to perform better when properly motivated towards a goal. There is portmanteau of evidences to suggest that self-efficacy plays a unique role in motivating extension practitioners for effective service performance. Extension practitioners must engage in activities that will promote and build self-motivation and assertiveness towards the attainment of set goals. The implication of self-efficacy for extension service delivery was also extensively discussed.

KEYWORDS: Self-efficacy, motivation, performance, satisfaction, self-evaluation

1. INTRODUCTION

The range of responsibilities for extension practitioners is numerous but many outside the profession are unaware of these numerous task. For effectiveness, an extension officer must be conversant with instructional and management skills for participatory communicative interventions which are developed through practical training, planning, theory and strategic management. Extension advisors are saddled with empowering farmers to achieving their primary goals of becoming creative and productive. However, the challenges encountered by extension revolve round inadequate motivation, goal initiation and setting, planning, communication and problem solving skills. Moreover, this multiplicity of challenges varies depending on the model used in extension facilitation and advisory services. The only way of promoting extension practitioners' motivation to learn and address these challenges independently is through building self-efficacy. Self-efficacy is an assessment of an individual ability to undertake and perform a given task (Bandura, 1986). Self-efficacy, as noted by Snyder and Lopez, (2007) is what one believes that he or she can undertake a given task using his or her own expertise or ability under a given conditions. Extension must have

²⁷ Faculty of Agriculture and Natural Sciences, Department of Agricultural Extension and Rural Resource Management, University of Mpumalanga. Private Bag X11283, Nelspruit, 1200. Email: isaac.agholor@ump.ac.za

self-direction and exhibit a sense of self-efficacy to provide farmers with opportunities to mitigate challenges and be able to exercise control over problem solving. Bandura's theory illustrates explicitly how the development of cognitive components such as motivation and self-regulation assist in learning and performance achievement. The delivery of quality extension services remains one of the focal issues in the contemporary extension policy discourse. The awareness, attitudes and values which an individual holds about his abilities affects his work performance. The pessimistic perception and negative comments about quality extension services delivery has been on-going but little has been done to evaluate the concept of self-efficacy in extension practice. The concept of self-efficacy is part of social cognitive theory which explains that a person is the determinant of his own development and can also proactively make things happen by his evolution (Ashford & LeCroy, 2010). Self-efficacy is also described as an important facet of human motivation which denotes a positive self-prophecy about one's capabilities premised on oriented outcomes, relayed experiences, verbal inducement, and functional feedback (Gecas, 2004). Self-efficacy is exemplified and implicitly concerned with perception of individual capabilities and ability, as opposed to self-esteem which is focused on value perception of an individual's worth (Woolfolk (2007).

The concept of self-efficacy is derived from social cognitive theory which illustrates how individual acquire and conserve certain behaviour consistent with time (Bandura, 1986). The theory postulates that individuals are the architect of their own development and can cause things to happen by their own actions. The theory of Bandura recognises four important areas peculiar to human which encompasses cognitive, vicarious, self-regulatory and self-reflections. The perception of social cognitive theory is that individuals are never driven by any know internal forces nor moulded and controlled by external forces but dependent on a model of "triadic reciprocity" where there is interplay of behaviour, cognitive, personal factors, and environmental factors interacting with each other to determine behaviour. For instance, the manner in which an individual interprets the outcome of his or her own behaviour affects successive behaviour. This is the basis of Bandura's (1986) idea of Reciprocal determinism illustrating that the interaction between personal factor (cognitive, affective, and biological events); behaviour of an individual and environmental factors creates triadic reciprocity.

The social cognitive theory postulated that individuals are never driven by any know internal forces nor moulded and controlled by external forces but dependent on a model of "triadic reciprocity" where there is relationship between behaviour, cognitive, personal factors, and environmental factors interacting with each other to determine behaviour. An individual self-efficacy is associated with increased self-motivation, increase readiness to learn new ideas, increase competence and management skills (Woolfolk, 2000). Things happens as an upshot of an actions, and it follows that the outcome a person envisage is dependent on perceived feelings of how well he or she would perform in a given setting. In consideration of individual social, intellectual and physical endeavours, Bandura (1986) noted that people who see themselves highly efficient and successful will definitely anticipate favourable results, while individuals who wallow in self-doubt will expect average performance which translates into negative results or outcomes. An extension officer with a greater self-efficacy is more likely to be self-assured about his or her capabilities and, therefore, more likely to remain focused, assertive and result oriented in the profession (Tschannen-Moran M & Woolfolk H 2001)

Self-efficacy has been justified by a myriad of empirical research for providing the foundation for individual motivation and self-achievement. Until individuals believe that

their actions can “harvest” or bring about a desirable outcomes they need, they have little or no motivation to act or to be resilience in the face of challenges. Extension advisors are engrossed in creating change, and as a change agent, must possess certain qualities for enhancing the well-being of the farmers and be capable of altering the negative behavioural aptitudes towards innovation adoption and the social relationships under which farmers live. Adopting the social cognitive theory as a conceptual framework for behavioural change, extension advisors should thrive to improve the farmers’ frame of mind and to adjust or mitigate erroneous self-belief, habits and conservatism (personal factors), enhance their skills and self-regulatory performance (behaviour) and change the negative views on bio-diversity concept (environmental factors) that may be a barrier to farm business success.

1.1 Purpose of the paper

Motivation comes from inner satisfaction and belief that an individual is capable of completing and attaining a desired goal (Lunenburg, 2011). With increase in self-motivation, there is a concomitant growth in self-efficacy. Extension practitioners are likely to perform better when properly motivated towards a goal. The purpose of the paper were to examine the sources of self-efficacy, physiognomies, procedure for goal realisation, and implication of self-efficacy in extension practice. The aim of the paper is to review the self-efficacy concept, sources, physiognomies, goal realisation and implication for Extension.

1.2 Objectives of the study

The paper gave an in-depth review, firstly, the self-efficacy concept, sources and physiognomies and secondly the implications of self-efficacy in extension practice.

2. METHODOLOGY

2.1 Sources of Self-Efficacy

There are four main sources of self-efficacy as postulated by Bandura (1994), this includes:

- (i) Mastery experiences or performance outcome: this encapsulates the initial success one derives from an activity which on the long run activates enthusiasm and motivation to perform further task in future. Initial success in a given task builds up a person’s self-efficacy while disappointment or failure destabilizes self-efficacy. Nevertheless, individuals who obtained success under a ‘platter of gold’ or getting very easy success may be demotivated by failure and are less resilient (Bandura 2004). In some instances, failures and difficulties in human endeavours cascades into valuable means of illustrating that success requires persistent effort. It bears noting that it is only when people realises that they possess the qualities to succeed, that they persist in the midst of difficulties or hardship, develop resilience and quickly recover from adversity. The most important source of self-efficacy is the mastery of experience, usually referred to past performance. Positive or negative performance outcome can impact on the capability of a person to carry out efficiently a given task in future. For instance, the successful completion of previously given task, may trigger confidence to venture into a similar task in future with higher self-efficacy (Bandura 1977). The opposite is true for individual who experiences dismal failure in a given task. Such individual who has failed previously may develop apathy and disillusioned with low-self efficacy towards attempting a similar task in the future.

(ii) Vicarious experiences: this allows individual to learn a new and successful behaviour without necessarily undergoing any form of training; but merely observing a person or a peer perform successfully a given task which typically raises the enthusiasm of the observer culminating into a sustained effort that he or she can also succeed. This type of exemplary and observational learning is determined by the level of attentiveness, engagement and self-motivation of the observer. In contrast, seeing or observing others fail irrespective of determined effort exerted in a given task decreases observers' evaluation of his own self-efficacy resulting to aversion and undermining ones performances. It is worth noting, that if the behaviour under observation produces treasured and valuable outcomes, the observer becomes motivated to accept the behaviour and internalise it for future use. The influence of modelling on self-efficacy is determined by observed similarity an individual possesses and likened to the models. The higher the presumed compatibility, the more the models' succeeds. When people discover that the perceived attributes of the observed model has no affinity or not compatible with their perceived expected competencies then their perceived self-efficacy will not be influenced by the models' behaviour and the outcome therein.

(iii) Social persuasion: social persuasion is a sort of intrinsic motivation geared towards an individual with a view of exerting more effort to succeed. According to Bandura (2004) individual who possesses self-doubt may be assisted to be convinced that he or she possesses the capabilities to succeed in a given task. Nevertheless, persuasion may undermine the inherent potential belief of ones capabilities faster than inculcating actual belief. It stands noting that deceitful persuasion can be a problem to self-efficacy if the requisite performance is not attained by the person concerned (Bandura, 1994). A person's belief in their efficacy motivates and take-over the mainstream of their activities, the effort exerted in various actions and their level of resilience. Though verbal persuasion tends to be a weak source of building self-efficacy beliefs than mastery of experiences or past experience, Redmond (2010) noted that it is universally accepted and applied because of its availability and simplicity.

(iv) Physiological feedback (emotional arousal) - The emotional state of an individual also influences to some extent self-efficacy: Individuals experiences nervousness, fretfulness, uneasiness and in some cases a pricking heart when talking to a large audience or during examination influences self-efficacy. These emotional feelings reduces or lower's ones self-efficacy. It bears to note that individuals are more likely to perform better when they are at good emotional state and therefore, higher conviction of self-efficacy. The emotional arousal according to Bandura 1994, is the least determinant of self-efficacy when compared to the other efficacy sources. Many people depend on their emotional status in measuring their capabilities. Often people construe their uneasiness, anxiety and mood as signs of weakness and susceptibility. However, mood that is positive increases self-efficacy while downhearted or hopeless mood undermines and reduces self-efficacy. A more distinct way of increasing self-efficacy is to enhance physical and expressive happiness and lessen undesirable emotional conditions. An improved self-efficacy belief seriously influences physical conditions of an individual. Bandura (1997) observed that individuals live in "psychic environment" that are mainly of their own making.

Sources of information for self-efficacy judgement

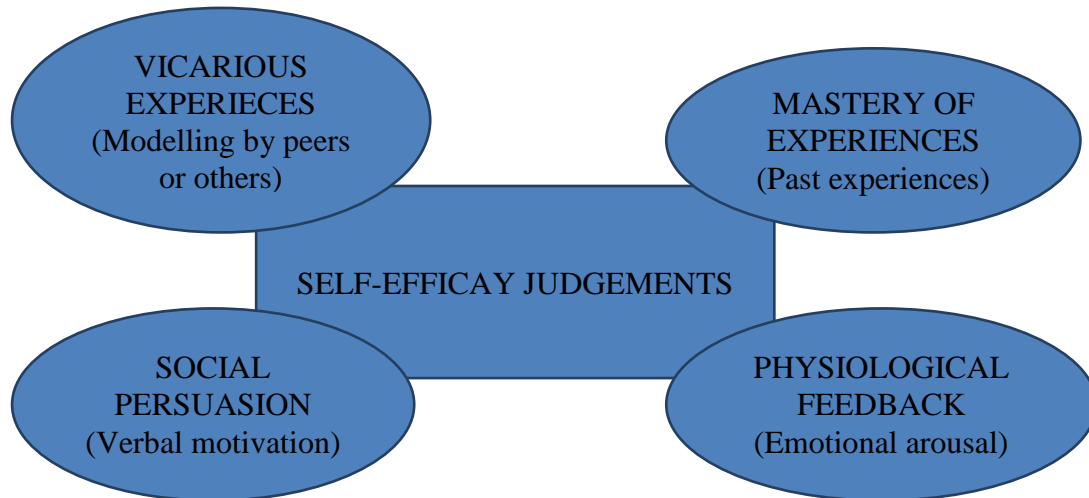


FIGURE 1. Sources of information for self-efficacy judgement

3. THE PHYSIOGNOMIES OF SELF-EFFICACY

Professed self-efficacy has been discovered to be necessary in making an individual to develop an intention to carry out a pre-determined task (Feltz & Reissinger, 1990; McAuley, 1992). Individual with high self-efficacy exhibits the following physiognomies: firstly, they see a challenging obstacles as a task to be learnt. They develop self-confidence and approach a problem situation or challenges with positive mind to succeed. Secondly, an individual with high self-efficacy are more disposed to risk taking and are also able to generate unfathomable interest in the activities in which they are involved. Thirdly, individuals with high self-efficacy are more resilience with a high sense of fulfilment as they view mistakes as first attempt in learning. In the face of failure or setbacks, they recover and adjust quickly and forge ahead (Pajares (2002)). Fourthly, individuals with high self-efficacy are usually able to accurately assess their own ability. These class of individuals indulges in self-examination and are not over ambitious nor too optimistic but able to evaluate themselves with the aim of self-advancement.

In contrast, individuals with low self-efficacy exhibits the following physiognomies which includes: firstly, such individuals display general dispiritedness to taking risk or trying anything new because they are not assured that the outcome of the attempt will be successful. Secondly, individuals with low self-efficacy as noted by Frank (2011) are engulfed in fear and usually depicting doubts towards a given task. Thirdly, persons with low self-efficacy has problem of negative impression management whereby putting forward a substantial level of behaviour in other to be seen as accepted or seeking an approval from others. Individual with Low self-efficacy seeks to be validated or approved by others culminating into worry about how others may perceive or assess them. Such individuals losses confidence in their own ability.

3.1 Goal realisation of self-efficacy

Social cognitive theory postulates that individuals are the major determinant of their personal motivation, behavioural pattern, and improvement within a linkage of mutually interacting

stimuli (Bandura 1999). Individuals as contributors to their personal life situations, Bandura (2005) noted that individuals are self-organized, proactive, regulated and self-reflective. Bandura developed the social cognitive theory in response to the inadequacies envisaged in the behaviourism and psychoanalysis theories (Redmond 2010). This dissatisfaction, as observed by Bandura was in the areas of cognition and motivation. As noted by Crothers, Hughes & Morine (2008) the theory of Albert Bandura's cognitive theory stressed how cognition, behaviour, personal and ecological factors act together to influence individual motivation and behaviour (Crothers, Hughes & Morine 2008). The social cognitive theory alluded to the fact that the causes of human behaviour are due to "reciprocal determinism". The notion to this conception of reciprocal determinism is that one's behaviour is influenced and moulded by the behaviour itself. In specific term, the kind of reciprocal determinism preferred by social cognitive theorist is referred to as *triadic reciprocity* (Bandura 1978). This conception illustrates that behaviour, environment, and personal factors (cognition, temper) interact and perform as influencing factor to each other. The triadic reciprocity concept can be illustrated in real-world situation through an example of working together in an interactive process between a parent and a newly born baby. The parents owe the baby a duty of care. Assume a situation where the baby has irritating temper of crying constantly and this was noticed from birth and is mostly likely to be genetic or biological. The baby's irritating temper is an example of personal factor. The constant cry of the baby is demanding and requires attention as the baby sleeps only for short time (behavioural factors), and this triggers an environment to be created which is exemplified in the form of noise, and inadequate opportunities for sleep, interacting with the personal factors of the parents to assist in shaping their own behaviour in the direction of being tired, irritating, worried, and unhappy. The aftermath of the parents behaviour will began to shape the environment of the baby, and the baby's behaviour will also continue to shape the environment of the parents. This is as a result of the interaction between the triad (personal, behavioural and environmental factors) which contributes at different magnitude (Crothers et al 2008).

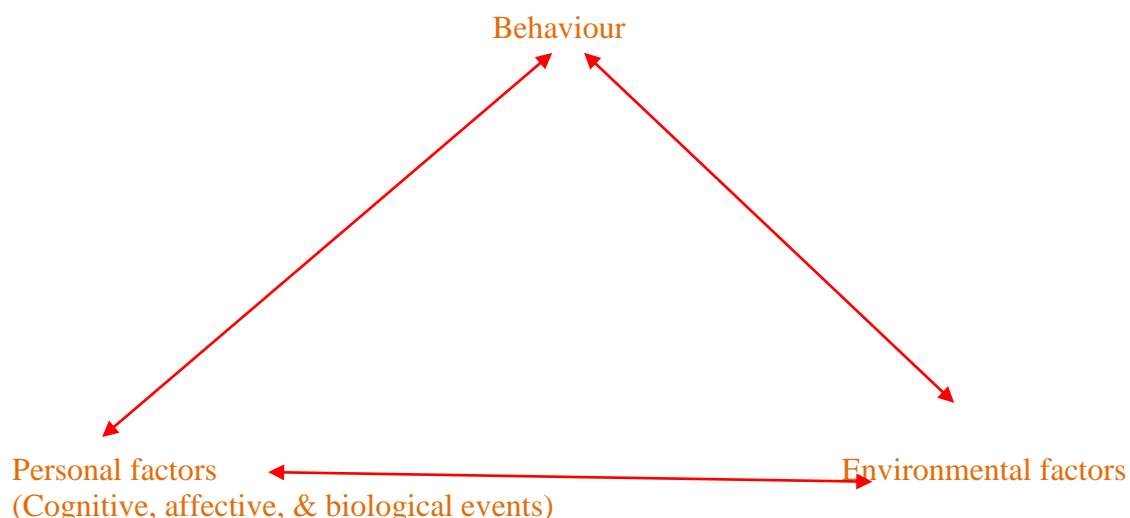


FIGURE 2. Conceptual model of Triadic Reciprocal determinism

The goal realisation of the social cognitive theory is made up of four main processes: self-observation, self-evaluation, self-reaction and self-efficacy (Redmond, 2010).

Self-observation: the self-observation as a process of goal realisation can be informative and motivating because it allows for an assessment of one's improvement or achievement toward a set goal. Self-observation encompasses regularity and proximity. The former (regularity)

implies that behaviour should continuously be observed while the latter (proximity) entails that behaviour should be observed when it happens or soon thereafter. However, self-observation is inadequate means of goal realisation because, for an individual to be motivated depends on his expected results and self-efficacy (Zimmerman & Schunk 2001).

Self-evaluation: this allow individual to liken their performance or progress to a desired or anticipated goal. Goals must be standardized and specific. It bears noting that goals such as “I will do my best” are ambiguous and certainly will not motivate. In specifying goals, Schunk & Zimmerman (1994) posited that specific goals stipulates the amount or level of effort needed for success and increase self-efficacy because improvement is easy to measure. Two types of self-evaluation exist: absolute or fixed and normative. The self-evaluation with grading scale is referred to as absolute while the self-evaluation that compares ones’ performance against another person’s performance is referred to as normative (Schunk & Zimmerman 1994). Individuals are usually satisfied when they attain goals that are ascribed value and are likely to exert more effort towards higher performance (Bandura 1989).

Self-reaction: responses to one’s progress can be a motivating factor towards developing self-efficacy. When the responses or reaction to progress attained is acceptable, then obviously one will develop high self-efficacy with positive intention to continue a given task. However, a negative self-reaction might also be able to activate further inner ‘will power’ to work harder. The achievement of a set goal may likely induce or encourage an individual to re-evaluate and increase the standard of the goal for further achievement; while, if an individual has not attain the set goal, they may probably re-evaluate and reduce the set standard with the intention of achieving (Bandura, 1989).

Self-efficacy: another source of goal realisation is self-efficacy which is the belief about one’s ability to carry out a determined task. The positive belief towards the completion of a task can be encouraging in itself (Van der Bijl & Shortridge-Baggett, 2002). High Self-efficacy escalates the intended effort to be exerted toward a given task.

Processes of Goal Realization



FIGURE 3. Processes of Goal Realisation Source: Pajares (2002). Overview of social cognitive theory and Self-efficacy.

3.2 IMPLICATION FOR EXTENSION

Extension practitioners who have been able to develop high self-efficacy undertake challenging task with special proficiency. They develop vested interest and are committed to goal attainment and heighten zeal in time of failure. Furthermore, they move swiftly to recuperate their sense of efficacy after having failed, and ultimately associate setback to inadequate effort. On the other hand, extension advisors with low self-efficacy assume and hold to the belief that a give task is impossible thereby generating fretfulness and depression. In sum, the perseverance which is aligned to high self-efficacy is likely to lead to improved performance, as against giving-in which is likened to low self-efficacy. The addition of activities aimed at increasing extension advisors' self-efficacy is likely to increase the adoption of new skills and ideas presented to farmers. The primary step for extension to succeed with farmers will be to acquire the perception and vehemently exert control over outcomes associated with new innovations. It is the author's belief that if this primary step is denied, then the willingness in promoting adoption of innovation by farmers will be a mirage. There are plethora of evidence that emanated from various studies that it is possible to increase Extension advisors self-efficacy by applying techniques such as skill building,

evaluation of performance, behavioural modelling practice, motivation, and experiential education. The implication here is that extension practitioners must adopt a variety of techniques towards building higher self-confidence and competency as an embodiment of self-efficacy for effective and quality performance. In the authors view, a suite of extension activities like regular seminars and conferences, field days and symposium could also be useful as tools towards developing self-efficacy.

4. CONCLUSION

Motivation comes from inner satisfaction and belief that an individual is capable of completing and attaining a desired goal. With increase in self-motivation, there is a concomitant growth in self-efficacy. Extension practitioners must engage in activities that will promote and build self-motivation and assertiveness towards the attainment of set goals. The importance of self-efficacy cut across individual decision making ability, inspiration, and irrepressibility and behaviour modification for goal attainment. In sum, it bears noting too, that self-efficacy is a determinant factor and a predictor of performance outcome. There is portmanteau of evidence to suggest that self-efficacy plays a unique role in the motivation of extension practitioners for effective service performance.

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WILLINGNESS TO ENROL INTO UNIVERSITY AGRICULTURAL EXTENSION TRAINING PROGRAMME BY MID-CAREER FEMALE AGRICULTURE WORKERS IN KWARA AND NIGER STATES, NIGERIA.

Ogunlade, I.,²⁸ Akeredolu, M.²⁹ Kante, A³⁰. & Owoeye, B.³¹

Correspondence Author: M Akeredolu, Email: makeredolu@field.winrock.org

ABSTRACT

The Collaborative efforts between University of Ilorin and Sasakawa Africa Fund for Extension Education to upscale the Knowledge of mid-career Agricultural Workers through B.sc degree in Agricultural Extension and community development has been on for the past four years. The applicants for this programme have been on the low side most especially the female. This study therefore examined the Willingness to enrol into University Agricultural extension training programme by mid-career female Agriculture Workers in Kwara and Niger States, Nigeria. The specific objectives are to:- describe the socio-economic characteristics of the mid-career female Agricultural workers in the study area, determine the level of willingness to enrol, investigate the factors inhibiting their enrolment and examine the factors promoting their enrolment. This was carried out using structured questionnaire to obtain data from a total of 140 mid-career female Agriculture workers who were purposively selected based on their employment with the Agricultural Development Agency or the Local Government commission in their respective States. Descriptive statistics such as Frequency counts, percentage, mean and ranking were used to analyze the socio-economic characteristics while the inferential statistical tools such as chi-square was used for Hypothesis 1 and Multinomial Logistic regression to test for Hypothesis 2.

The findings show that mid-career female Agricultural workers had the mean age of 42years. Most of them are married (95.7%) with house hold members ranges from 6-10 people. Also, (37.1%) have 6-10years of working experience with mean income of #38,000.

The chi square analysis result shows there is a significant relationship existed between all the selected socioeconomic characteristic of mid-career female Agricultural Workers and their willingness to enrol in the study area. Age ($\chi^2=96.857$, $p<0.000$), marital status ($\chi^2=59.586$, $p<0.000$), household size ($\chi^2=92.829$, $p<0.000$), Work Experience ($\chi^2=58.457$, $p<0.000$) and Income per month ($\chi^2=31.257$, $p<0.000$). And Multinomial logistic regression analysis reveals significant relationship existed between respondents inhibiting factors and their willingness to enrol into University training Programmes.

It was concluded that the mid-career female Agricultural workers are willing to enrol into University trainings but the factors inhibiting their willingness tends to prevent them. Based

²⁸ Department of Agricultural Extension and Rural Development, Faculty Agriculture, University of Ilorin, Nigeria.

²⁹ West Africa SAFE Coordinator, Nigeria. Email: makeredolu@field.winrock.org

³⁰ Department of Agricultural Extension and Rural Development, Faculty Agriculture, University of Ilorin, Nigeria.

³¹ Department of Agricultural Extension and Rural Development, Faculty Agriculture, University of Ilorin, Nigeria.

on the findings, it was recommended that mid-career female Agriculture Workers should be encouraged to join a registered cooperative society to build up savings for the Programme. Also, SAFE Co-ordinators, should sensitize Federal colleges of Agriculture for their graduates to enrol in the Programme.

Key words: willingness to enrol, mid-career female agricultural worker, university agricultural training, enrolment promotion factors, enrolment inhibiting factors

1. INTRODUCTION:

In Nigeria, Sasakawa 2000 has supported the generation of technology and innovations in Agriculture to boost production and increase farmers income. Unfortunately, the research results have not been adequately transferred to the farmers due to the low level of technical education by agricultural extension agents. The Collaborative efforts between University of Ilorin and Sasakawa Africa Fund for Extension Education to upscale the Knowledge of mid-career Agricultural Workers through B Sc degree in Agricultural Extension and community development has been on for the past four years. The applicants for this programme have been on the low side especially the female folk. Women are very important in this programme based on the FAO (2011) report that ‘Women constitute 43% of Agricultural Labour force in developing countries which ranges from 20% in Latin America to 50% in Eastern Asia and Sub-Saharan Africa’. There is need for improvement in Agricultural Education and Extension Work with rural women as reduction in Gender inequalities could lead to more productive resources and services which increases yields on women’s farms by 20-30%, which could raise Agriculture output in developing countries by 2.5-4% . In spite of the opportunity created for women to become extension agents in increase of Agricultural productivity among women, women still has less sufficient representation in Agricultural Sciences around the World. According to Beintema (2006:1) only ‘‘ one out of five Agricultural researchers in developing world are Females’’. UNESCO (2003:81) reported that in 2000, 20 percent of Agricultural students in Africa and Arab countries were made up of women when compared with 47 percent in Europe. Tuwora & Sossou (2008) argued that the root cause of low retention of girls in school as compared with boys is due to gender inequality and discrimination against women in general due to patriarchal systems of social organization and other socio-cultural practices of early marriage, child slavery, and fostering or trafficking of children, poverty, and multiple household duties, and a lack of economic and social opportunities.

Cusack (1999) asserted that large factors constitute the oppression and status of women which originated in the family and in the society. This author further revealed that the society, tradition and religion supports male’s dominion and it has created some beliefs which has evolved into reasons why things are the way it is. Ogundipe-Leslie (1991, P.25) defined culture as a way of life and people’s belief which was as a result of their relationship with others. Kolawole (1998), defined gender inequality in Africa as a product of misconception of culture which has resorted into having women to have less or no value. She argued that culture is used as a tool to oppress the female world.

Akeredolu (2009) classified the possible causes of low women willingness into four:

- Institutional bias that considers Agriculture to be the domain of men and hinders investment in women’s Education.
- Women have limited access to Information about additional educational opportunities.
- Lack of programs tailored for women professionals.

- Family responsibilities, time constraints, and socio-cultural or religious barriers that hamper women's ability to participate in full-time training programs.

2. PURPOSE AND OBJECTIVES

The study determines willingness to enrol into University Agricultural Extension training by mid-career female Agricultural workers in Kwara and Niger State.

Specifically it;

1. Describes the socio-economic characteristics of the mid-career female Agricultural workers in the study.
2. Determines their willingness to enrol in University Agricultural training.
3. Investigates the factors inhibiting their enrolments.
4. Examine the factors promoting their enrolment in the University Agricultural Extension training in the study.

3. HYPOTHESES OF THE STUDY

H₀₁: There is no significant relationship between the Socio-economic characteristics of the mid-career female Agricultural workers and their willingness to enrol in the University training.

H₀₂: There is no significant relationship between factors inhibiting the mid-career female Agricultural workers and their willingness in the University Agricultural Training.

4. METHODOLOGY

This study was carried out in Kwara and Niger states of Nigeria. These states are part of the catchment areas for the training program and well known for high Agricultural activities. Kwara State is located between latitudes 7°45'N and 9°30'N and Longitudes 2°30'E and 6°25'E. There is a total of one thousand, two hundred and fifty eight rural communities in Kwara State (National Population Commission, 1991). More than 90% of the rural populations who constitute about 80% of the total population are engaged in farming. Kwara State is divided into four Agricultural Development project zones. Niger State is located in North-central Nigeria between Latitudes 8°20'N and 11°30'N and Longitudes 3°30'E and 7°20'E with a total land area of 76,363 square kilometres and a population of 4,082,558 people (Wikipedia, 2008). Structured questionnaire was used to elicit information from a total of 140 mid-career female Agriculture workers who were purposively selected based on their employment with the Agricultural Development Agency or the Local Government commission in their respective States. The survey instrument covered the socio-economic characteristics, factors inhibiting and promoting enrolment as well as willingness to enrol. Willingness to enrol was developed around the level of information sought on the program that could assist the respondent to decide to enrol. Data were analysed using descriptive statistics such as Frequency counts, percentage, mean and ranking and inferential statistics such as chi-square and Logistic regression..

5. RESULTS, PRODUCTS, AND/OR CONCLUSIONS

The findings show that, mid-career female Agricultural workers had the mean age of 42 years. Most of them are married (95.7%) with 8-7years mean working experience and mean income of #38,000. Sixty percent of respondents were willing to enrol for University Agricultural Extension trainings while 40% were not willing. This corroborates the work of

Laura (2007) who posited that student participated willingly based on the benefit of the programme. Factors inhibiting mid-career female Agricultural workers' enrolment which were presented to the respondents included: Financial Problem (\bar{x} =2.51), Academic Stress (\bar{x} =2.16), Family commitment (\bar{x} =2.30), Transportation (\bar{x} =2.00), Insufficient awareness (\bar{x} =2.15), unsuitable time-table (\bar{x} =2.13), imbalance family work with programme (\bar{x} =2.00), Lack of coordination of women in programme (\bar{x} =1.72) and lack of recognition of female participants (\bar{x} =1.64). Thirteen (13) factors promoting enrolment into University Agricultural trainings were: promotion to highest level in chosen career (\bar{x} =3.44), Recognition attached to programme (\bar{x} =3.24), Self-interest (\bar{x} =3.20), Bridge gap between HND and B Sc (\bar{x} =3.19), Organizational demand (\bar{x} =3.10), Husband's Interest (\bar{x} =2.86), Career development and friend's motivation (\bar{x} =2.79), Lack of access to career opportunities (\bar{x} =2.75), Lack of job (\bar{x} =2.67) and un-conduciveness of present career (\bar{x} =2.58). This result supports the finding of Akeredolu (2009) that family responsibilities, time constraints, and socio-cultural or religious barriers hamper women's ability to participate in full-time training programs.

Table 1: Distribution of the Socio-economic characteristics of the mid-career Female Agriculture workers in Kwara and Niger States.

Socioeconomic Characteristics	Frequency N=140	Percentage N=100%	Mean
Age			
≤25	1	0.7	
26-30	7	5.0	
31-35	26	18.6	42
36-40	40	28.6	
≥40	66	47	
Marital Status			
Single	5	3.6	
Married	134	95.7	
Divorced	0	0	
Widowed	1	0.7	
Family Size			
≤5	52	37.1	
6-10	81	57.9	7
≥10	7	5.0	
Work Experience			
≤5	27	19.3	
6-10	52	37.1	
11-15	36	25.7	8
≥150	25	17.9	
Income			
≤15,000	3	2.1	
15,001-25,000	9	6.4	
25,000-35,000	49	35.0	38,000
≥35,000	79	56.4	

Source; Author 2015

Table 2: Factors affecting the willingness to enrol into University Agricultural Extension Training Programmes by mid-career female Agriculture workers in Kwara and Niger States, Nigeria.

Willingness Level	Frequency	Percentage
Low Willingness	56	40
High Willingness	84	60

Source: Field Survey, 2015.

Table 3: Factors inhibiting mid-career female Agriculture Workers' enrolment into University Training Programme (SAFE).

Inhibiting Factors	Very Serious	Serious	Not Serious	MR	Rank
Financial Problem	86	41	13	*2.51	1 st
Academic Stress	42	78	20	*2.16	4 th
Family commitment hinders smoothness of the programme	60	61	19	*2.30	2 nd
Transportation	35	65	40	*2.00	6 th
Lack of recognition attached to the programme	10	70	60	1.64	8 th
Lack of proper coordination of women into the programme	20	62	58	1.72	7 th
Imbalance family work hinders smoothness of the programme	33	75	32	*2.00	6 th
Suite table time-table that helps Home-Management	41	77	22	*2.13	5 th
Insufficient awareness of the programme	50	62	28	*2.15	3 rd

Source: Field Survey, 2015

Chi square analysis result shows that a significant relationship existed between all the selected socioeconomic characteristic of mid-career female Agriculture Workers and their willingness to enrol in the study area. Age ($\chi^2=96.857$, $p< 0.000$), marital status ($\chi^2=59.586$,

p< 0.000), household size ($\chi^2=92.829$, p< 0.000), Work Experience ($\chi^2=58.457$, p<0.000) and Income per month ($\chi^2=31.257$, p<0.000). And Multinomial logistic regression analysis reveals that significant relationship exist between transportation, lack of recognition attached to the female participant by the employer, Imbalance family work with the Programme and Insufficient awareness of the Programme are significant at 5% level of confident and willingness of respondent to be enrolled into the university training programme.

Table 4: Factors promoting enrolment into University Agricultural Training Programme (SAFE) by Mid-career female Agriculture Workers.

Promoting Factor	MR	Ranking	Decision
Bridge the Gap between HND and B.Sc.	3.19	4 th	Major
Aid promotion to highest level in my chosen career.	3.44	1 st	Major
Have additional qualification	3.24	2 nd	Major
Career development	2.79	7 th	Major
Husband's interest	2.86	6 th	Major
Friend /associate motivation	2.79	7 th	Major
Parental interest	2.44	11 th	Not Major
Organization demand	3.10	5 th	Major
Self –interest	3.20	3 rd	Major
Recognition attached to the programme	3.24	2 nd	Major
Lack of job appraisal	2.67	9 th	Major
Lack of access to career opportunities	2.75	8 th	Major
Un-conduciveness of present career	2.58	10 th	Major

Source: Field Survey, 2015.

6. RECOMMENDATIONS & APPLICATION

The program organizer may have to consider the possibility of including the program in the distance learning to bring it close to the participants. This would enable the participants opportunities to serve their families and also engage in learning. The importance of the program in value added agriculture especially its focus on post harvest activities need to be made known to the employers of the prospective participants to enable them encourage and release their female workers.

This study recommends that mid-career female Agriculture Workers should be encouraged to join a registered cooperative society to build up savings for the Programme, SAFE Co-ordinators, should sensitize Federal colleges of Agriculture for their graduates to enrol in the Programme and considers alternate mode of delivery.

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THE IMPACT OF EXTENSION SERVICE ON MARKETING INFORMATION IN SMALLHOLDER FARMERS: A CASE STUDY OF MPUMALANGA PROVINCE IN SOUTH AFRICA.

Mmbengwa, V. M.³², Myeki, L.³³ & Khoza, T. M.³⁴

Correspondence Author: V M Mmbengwa, Email: VMmbengwa@namc.co.za

ABSTRACT

Smallholder farmers regardless of where they are located play a crucial role in the socio economic advancement of South African rural communities. However their agricultural production does not meet the necessary volumes and thus are constraint to household food security. The aim of the study was to find out the impact of extension services on the access to marketing information. On the other hand the objective was to increase access to marketing information to these farmers in order to improve their production. A cross sectional survey was conducted using purposive sampling. The sample was constituted by farmers (N=43) from different local municipalities of Mpumalanga province. The study used the Structural Equation Modelling (SEM) to analyse the impact of extension service on the access to marketing information. The results revealed that the extension services do influence different marketing information capabilities of smallholder farmers. According to the results, extension service has high likelihood of improving smallholder farmers' knowledge ($z=18.36$, $\beta= 1.00$, $SEM = 0.69$, $p < 0.001$), interpretation capacity ($z=18.44$, $\beta= 1.059$, $SEM = .072$, $p < 0.001$), Dissemination capacity ($z = 18.33$, $\beta= 0.956$, $SEM=0.073$) and use of marketing information ($z=26.96$, $\beta= 0.179$, $SEM = 0.039$, $p < 0.001$). The results imply that the impact of extension service to marketing information cannot be ignored if we are to improve production through effective market linkages. It is therefore recommended that extension workers are trained on marketing information for smallholder farmers.

Keywords: smallholder, marketing, commodities, extension, services

1. INTRODUCTION

Extension service is a concept that seems to have multi-explanations and is often defined in a more diverse, circumstantial, forms and styles (Mossie & Meseret, 2015; Fu & Akter, 2013 and FAO, 2010). According to GFRAS, (2012) extension service is a perceived to be effective instruments that may enable farmers to improve productivity, profitability and environmental protection across all agricultural sectors. Hence, it has received a considerable funding from various entities of the world such as government, NGOs and agribusiness firms with an estimated investment value of over 1 billion US\$ per year (Marsh, Pannell,& Lindner, 2014). In addition Davis, Nkonya, Kato, Mekonnen, Odendo, Miiro, & Nkuba (2010) argued that extension service is utilized by approximately 1 billion small-scale farmers in the entire world. However, there is still a fewer consensus on the size of returns to extension service investments in the world.

³² National Agricultural Marketing Council (NAMC), P/Bag X935, Pretoria, RSA and North West University (Potchefstroom Campus). Email: VMmbengwa@namc.co.za

³³ National Agricultural Marketing Council (NAMC), P/Bag X935, Pretoria, RSA

³⁴ National Agricultural Marketing Council (NAMC), P/Bag X935, Pretoria, RSA

In South African agricultural sector, Phuhlisani (2008) described the public extension services by providing statistics of their numbers, educational profiles and their key tasks (approximately 2155 officials, 1728 (80%) with a diploma qualification, 427 (20%) higher degrees, 204 (9%) with training in communication, 238 (11%) with project management, 143 (6%) computer literacy). Furthermore Phuhlisani (2008) states that 80% of extension service staff members are insufficiently qualified to function as Agricultural Advisors or subject matter specialists. This author proposed that for extension services to be efficient and productive, the following should be taken into consideration: the ratio of extension staff to farmers is crucial and has to be as follows: (i) Commercial farmers 1:21; (ii) Subsistence 1:857 and (iii) Combined 1:878. This ratio proposition may have positive impact on the dissemination of useful information, application of such information to practical farming problems and provision of solution to farmer's problems (Anaeto, Asiabaka, Nnadi, Ajaero, Aja, Ugwoke, Ukpogson, & Onweagba, 2012).

Several researchers have (GFRAS, 2012; Mossie & Meseret, 2015; Anderson & Feder, 2007; FAO, 2010) documented the impact of extension services on agricultural development, productivity, profitability, adoption of new technology, market access, access to credit, organization of farmers, advisory and policy advocacy. This is not exception to marketing information of the farming entities in South Africa. According to Ntshephe (2008) marketing information is information that jointly encompasses product, price, place and promotion. As a result a market-driven extension service is aligned to agricultural information mix (FAO, 2008). Hence Anandajayasekeram et al (2008) reported that agribusiness firms have attempted to integrate agro-processing, marketing operation, contract farming and information and communications technology (ICT) with extension service.

On the other hand, it appears that there is few or little information that seek to demonstrate the use of extension services to disseminate marketing information to smallholder farming sector in South Africa. The dissemination of marketing information seems to be an exclusive function of agri-business relative to extension services. This practise is happening despite the recommendations from several research findings. In view of the above-mentioned challenges, this paper attempts to find out the impact of extension services on the market information sources.

2. LITERATURE REVIEW

The concept of extension service is not new in agribusiness environments (Anandajayasekeram et al, 2008). Machila et al, (2015) highlighted that extension service concept is widely acknowledged and clearly defined by extension experts across the globe. Various researchers seem to have consensus in defining this concept. Researchers such as Fu and Akter, (2013), GFRAS, (2012); Mossie and Meserete, (2015); Quizon et al, (2001) and FAO, (2010) appear to define extension service as a service, process, programme or projects that provides information, knowledge, research, technology, adoption to improve farm production, income and welfare. Researchers such as Anaeto et al (2012); Machila et al (2015) and Ayanwuyi et al (2013), have succeeded in identifying the main function of extension service. According to these authors, the task of this service has to do with dissemination of information between agricultural research development institutions and farmers. Some of the researchers seem to think that the information disseminated should cover all facets of farming enterprises (Mossie and Meserete 2015).

This perception seem to influence the belief that the overall aim of extension service is to drive behavioural (traditional beliefs, attitudes and culture), economic (improved income and financial management) and social (reduce poverty, hunger and improve leadership and co-operation) of the farmers. Henceforth Anandajayasekeram, Puskur, Sindu, Workneh & Hoekstra (2008) and Mossie & Meserete (2015) argued that extension service is an engine for change and must be jointly embraced by public, private, multinational and multi-sectoral stakeholders of agriculture.

Anderson & Feder (2007) reported that agricultural extension service worldwide is dominated (80%) by government-funded extension services, followed (12%) by NGO extensions service and 5% private sector funded. This might imply that private sector attach low value to extension services relative to government and Non-governmental Organisation (NGOs). The impact of the marginal investment on the development of extension service has been widely documented by many researchers to date.

In some parts of Africa such as in Nigeria where this service had more impact on cassava production yield (that is, cassava yield increased from 52% to 78%), huge investment in the extension services seem to be paying dividends (Ayanwuyi, 2013). Okwoche & Asogwa, (2012) revealed that access to extension service had benefited farmers to realize more (44.4%) access to information on marketing, pests and diseases (42.22%), improved technologies (42.22%), chemical usage (41.11%) and agronomic practices (40%). Through this service, 38.89% of farmers we able to have information on processing and storage, 36.67% information on weeds and soil conservation, 35.56% information on cassava stalk varieties, 33.33% information on group formation and 32.22% information on agricultural credit.

In Zimbabwe, Machila, Lyne, & Nuthall (2015) found that extension service added per adult equivalent amounts of US\$282 to crop revenue. On the other hand, it is reported that in Uganda this service has led to a new agricultural sector policy, modernization plan of agriculture and integration of farmers to markets (Anderson, 2008). Other benefits of extension services were associated with good decision making by farmers, establishment of networks and modernity of farming (FAO, 2009). As a result of these benefits, the scope of extension service has since broadened to include market oriented services and agribusiness companies (Davis et al, 2007).

3. METHODOLOGY

This study was conducted in 2015 by National Agricultural Marketing Council (NAMC). It was commissioned to find out the impact of extension services on the marketing information sources. Its' objective was to increase access to market information through improved extension services.

3.1 Location of the study:

The study was conducted in various local municipalities of the Mpumalanga province of South Africa (Table 1). According to table 1, it is clear that 13 local municipalities were involved in the study. Of the 43 smallholder respondents, 30 (69.76%) were males as compared to 13 (30.23%) females. The majority of male smallholder respondents in this study were selected from Lekwa 4(100%), Mbombela 4 (100%) and Victor Khanye 4 (66.66%). Whilst female smallholder respondents were selected from Dipaleseng 5 (71.43%).

3.2 Data collection and sampling

This study was a cross-sectional study, where the data was collected through a closed ended questionnaire during interview. The sampling techniques used in the study were purposive sampling. A purposive sampling technique was preferred in this study as a result of the lack of reliable smallholder commodity database. According to Palys (2008), purposive sampling techniques is sampling based on the strategic choices linked to the objectives of the researcher.

3.3 Methodology of the study

The study used both qualitative and quantitative research approaches. The qualitative research approach was used during the initial phase and post result analysis phase of the study. In the initial phase, qualitative method was useful to introduce respondents to the study, whilst the qualitative approach used during post-analysis was useful in interpreting the results that was mainly quantitative in nature. The quantitative approach was used to collect the data using the survey questionnaire.

Table 1. Smallholder participants in the local municipalities of Mpumalanga province

LOCAL MUNICIPALITIES	GENDER	FREQUENCIES (n)	GENDER (%)	TOTAL	TOTAL (%)
1.Dipaleseng	Male	2	28.57	7	16.28
	Female	5	71.43		
2.Dr JS Moraka	Male	0	0.00	2	4.65
	Female	2	100.00		
3.Emalaheni	Male	0	0.00	2	4.65
	Female	2	100.00		
4.Govan Mbeki	Male	2	50.00	4	9.30
	Female	2	50.00		
5.Lekwa	Male	4	100.00	4	9.30
	Female	0	0.00		
6.Mbombela	Male	4	100.00	4	9.30
	Female	0	0.00		
7.Mkhondo	Male	2	100.00	2	4.65
	Female	0	0.00		
8.Msukaligwa	Male	2	100.00	2	4.65
	Female	0	0.00		
9.Nkomazi	Male	2	50.00	4	9.30
	Female	2	50.00		
10.Pixley ka Seme	Male	2	100.00	2	4.65
	Female	0	0.00		
11.Steve Tshwete	Male	2	100.00	2	4.65
	Female	0	0.00		
12.Umjindi	Male	2	100.00	2	4.65
	Female	0	0.00		
13.Victor Khanye	Male	4	66.66	6	13.95
	Female	2	33.33		
N	Male	30	69.76	43	100
	Female	13	30.23		

3.4 Data analysis

The study used both descriptive and inferential analyses in order to determine the impact of the extension services on variables such as knowledge transfer, interpretative capability, dissemination capacity and use of extension services. The descriptive analysis was used to provide the frequencies and proportional accounts of the variable of interest, whilst the inferential analysis was employed to provide the researchers with variabilities, co-variances and correlations of the variables. A structural equation modelling (SEM) was used for inferential analyses whilst the simple statistical analyses were used for descriptive analyses.

3.5 Model specifications

In designing this specified model (Figure 1), various processes were embarked on. Literature review was used to find out whether there is an existing model that explains the relationship of the variables of interest. Furthermore, perceived trends were explored. None of the above, gave the researchers concrete basis to formulate this model on the existing secondary information. Hence, the study was conceptualised based on exploratory constructs.

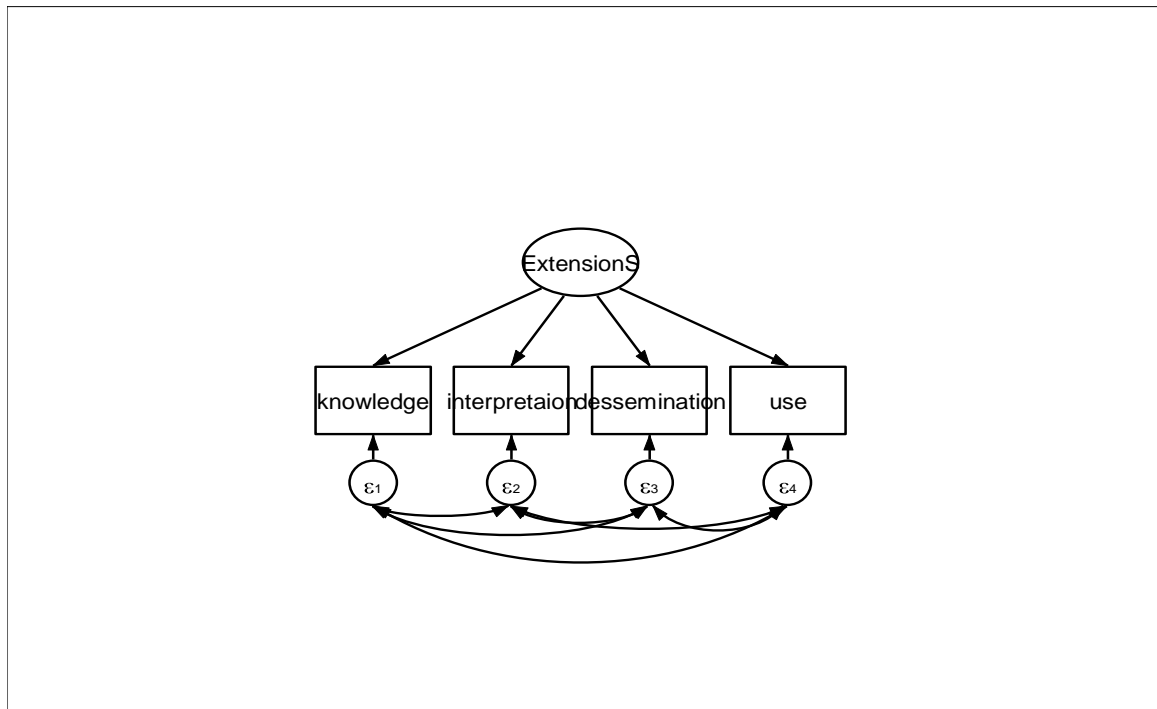


Figure 1: Proposed model for the impact of extension services on the smallholder farming source innovation.

Extension services variable and error term were measured as latent variables (unobserved variables), whilst other four indicators variables were measured using a three Likert scale measurements (scale: 1-3), where 1 represented “yes”, 2 represented “No” and 3 represented “I don’t know”.

3.5.1 Model equations

The proposed model was explained on the basis of its dependent and independent variables interactions. Prior to the development of the model equations, hypothetical assumptions were made. The following hypotheses were thus presented:

- a) Null hypothesis: Extension service has no impact on the variables of interest.
- b) Alternative hypothesis: At least extension service has an impact on one of the variables concerned.

In this model, four research questions were investigated:

- a) Does the extension service have a significant impact on the knowledge transfer of market information to smallholder farmers in Mpumalanga Province?
- b) Does the extension service have a significant impact on the interpretation capability of market information by smallholder farmers in Mpumalanga province?
- c) Does the extension service have a significant impact on the dissemination capacity of market information to smallholder farmers in Mpumalanga province?
- d) Does the extension service have a significant impact on the use of market information in the smallholder farming in Mpumalanga province?

In view of the model described above, the following equations were formulated:

$$Y_{kt} = \alpha + \beta_1 \text{ExtS} + e_1 \dots \dots \dots (1)$$

$$Y_{ic} = \alpha + \beta_1 \text{ExtS} + e_2 \dots \dots \dots (2)$$

$$Y_{dc} = \alpha + \beta_1 \text{ExtS} + e_3 \dots \dots \dots (3)$$

$$Y_u = \alpha + \beta_1 \text{ExtS} + e_4 \dots \dots \dots (4)$$

Where, Y_{kt} , Y_{ic} , Y_{dc} and Y_u are representing the knowledge transfer, interpretation capability variable, dissemination capability and the use of marketing information variables respectively. On the other hand, ExtS is representing extension services, β represents coefficient of extension service variance, α and e_1 are representing the constant and error term respectively.

3.5.2 Model fitting information.

Table 2 shows the results of the model fitting criterion where five variety of tests were used. Of the five tests conducted to find out how well the model is fitted, three tests {RMSEA, Baseline comparison (CFI) and size of residuals (CD)} were confirmed that the model has a good fit relative to two tests {Likelihood ratio ($p > \text{Chi}^2$) and information criteria (AIC & BIC)}. These two tests (LR & AIC) are known to be sensitive to the sample size. Noting that the current study had very small sample size ($n=43$), it was not surprising that these two tests had found that the model in question is not well good fitted based on their criterion. As a result of the majority of the tests conducted to determine the model, the proposed model was deemed to be well fitted and consequently, the model was used for this investigation.

Table 2: The results of the model fitting test for the proposed model

Tests	Fit Statistic	Value	Description
Likelihood ratio	Chi ² _bs (6)	61.113	Baseline vs saturated
	P > Chi ²	0.000	
RMSEA	90% CI, lower bound	0.000	Root mean squared error approximation
	90% CI, upper bound	-	
	Pclose	<= 0.05	Probability
Information criteria	AIC	136.968	Akaike information criterion
	BIC	163.033	Bayesian information criterion
Baseline comparison	CFI	1.000	Comparative fit index
Size of residuals	SMMR	0.000	
	CD	0.873	Coefficient of determination

4. RESULTS AND DISCUSSIONS

The results of the impact of extension services on the four indicator variables (that affect the smallholder farmers in Mpumalanga province) was presented in Table 3. According to the results, extension services have a positive and significant impact on all the four indicators {knowledge ($z=18.36$, $SEM = 0.69$, $p < 0.001$), interpretation capacity ($z=18.44$, $SEM = .072$, $p < 0.001$), Dissemination capacity ($z = 18.33$, $SEM=0.073$) and use of marketing information ($z=26.96$, $SEM = 0.039$, $p < 0.001$)}. These results imply that the null hypothesis (which indicates that Extension service has no impact on the variables of interest) is rejected in favour of the alternative one.

Furthermore, it could be deduced that increasing a unit of extension services to smallholder famers in the Mpumalanga province, could possibly lead to the corresponding increases of impact to each of indicator variables under consideration {Knowledge transfer ($\beta = 1.000$, $p < 0.001$), interpretation capacity ($\beta = 1.309$, $p < 0.001$), Dissemination capacity ($\beta = 0.955$, $p < 0.001$) and use of marketing information ($\beta = 0.180$, $p < 0.001$)}. These appear to indicate that extension service is very crucial in achieving the impact of marketing information access in the smallholder farming sector located in the above-mentioned province. Practically this may indicate the need for quality extension services for smallholder farmers so that their development towards commercialisation could be fast-tracked.

The results of the standardised estimates appear to indicate that there is a strong evidence ($\beta = 0.0882$, $p < 0.001$) that extension services have the highest positive impact on the interpretation of the marketing information by smallholder farmers in Mpumalanga province as compared to other indicator variables {Knowledge transfer ($\beta = 0.813$, $p > 0.01$), Dissemination capacity ($\beta = 0.761$, $p > 0.001$) and use of marketing information ($\beta = 0.262$, $p > 0.001$)}. In addition, the covariance and correlation test outcomes indicate that there is neither significant influence of the variables on their covariance nor correlation associated with their corresponding error terms at probability equals to 5%. Therefore, it could be inferred that relationship between these variables are of no practical significant and thus could ignored.

Table 3: Results of the impact of extension services on the smallholder capacity

Measurement	Unstandardized Estimates				Standardized Estimates			
	B	SE	Z	P> z	Beta	SE	Z	P> z
KT← Ext. Service _Cons	1 1.310	Con	18.3 6	0.00	0.813 2.833* **	1419. 13 0.345	0.00 8.20	1.000 0.000
IC← Ext. Service _Cons	1.059* ** 1.286* **	0.06 9	18.4 4	0.00	0.882* ** 2.846	0.028 0.347	31.95 8.21	0.000 0.000
DC← Ext. Service _Cons	0.955* ** 1.333* **	0.72 7	18.3 3	0.00	0.761 2.828* **	1327. 78 0.345	0.00 8.21	1.000 0.000
Use←Ext. Service _Cons	0.180* ** 1.071* **	0.04 0	26.9 6	0.00	0.263 4.160* **	458.7 9 0.479	0.00 8.68	1.000 0.000
Cov (e.KT, e.IC)	0.000	0.02 4	0.01	0.994				
Cov (e.KT, e.DC)	0.000	0.03 6	0.00	0.999				
Cov (e.KT, e.Use)	0.000	0.01 9	0.01	0.994				
Cov (e.IC, e.DC)	0.000	0.02 5	0.00	0.999				
Cov (e.IC, e.Use)	0.000	0.01 8	0.02	0.985				
Cov (e.DC, e.Use)	0.000	0.18 9	- 0.02	0.981				
r (e.KT, e.IC)					-0.000	4556. 02	-0.00	1.00
r(e.KT, e.DC)					0.001	5712. 66	0.00	1.00
r(e.KT, e.Use)					0.001	1325. 94	0.00	1.00
r (e.IC, e.DC)					0.000	3819. 57	0.00	1.00
r (e.IC, e.Use)					0.005	887.2 3	0.00	1.00
r(e.DC, e.Use)					-006	1130. 91	-0.00	1.00

Keys: Cons= constants, Con=constrained, KT=Knowledge transfer, IC=interpretation Capacity, DC =Dessemination capacity, Cov = covariance, r = correlations, *** indicates significance at the 0.01 level.

5. CONCLUSION AND RECOMMENDATIONS

The positive significant impact of extension service to marketing information indicators in the smallholder farming sector in Mpumalanga province was well-established in this study. Therefore, agricultural stakeholders in this province cannot afford to ignore the effect of this service if they need to improve production and subsequent commercialisation of the smallholder farming. In view of the fact that smallholder farming are known for their lack of consistent production, access to formal markets and capacity to source marketing information, it is recommended that extension services quality be prioritised with view to improve the smallholder access to marketing information. The use of modern information services transfer such as the use of SMS to the individual farmers may also be vital in achieving knowledge transfer and dissemination. Such extension services may be tailor made to languages that are understood by farmers. Classifying smallholder farmers into their educational profiles and transferring the marketing information to these clusters of farmers in routine basis may help in improving the status of smallholder commercialization in the aforesaid province. On the basis of the above-mentioned recommendations, it is therefore recommended that extension workers be supported through formal education and training, capacity building and incentive improvement. Without improving the extension workers' working condition after attaining their educational improvements, it may impact adversely to the workers' motivation during execution of their services. In addition, it may be a good idea that the Department of Agriculture in Mpumalanga province, revisits its extension policy in order to accommodate some of these recommendations.

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RESEARCH THEMES, AUTHORS, AND METHODOLOGIES IN THE SOUTH AFRICAN JOURNAL OF AGRICULTURAL EXTENSION: AN ANALYSIS OF 1999-2014 PUBLICATIONS.

Yusuf, S. F. G.³⁵ Cishe, E.,³⁶ Ndhleve, S.³⁷ & Jumbam, D.³⁸

Correspondence Author: S F G Yusuf, Email: fyusuf@wsu.ac.za

Abstract

The South African Journal of Agricultural Extension (SAJAE) is the scientific mouthpiece journal of the South African Society of Agricultural Extension (SASAE), established in 1966 through which it publishes research articles and dissemination. The study examined the primary and secondary research themes, prolific authors and research methods and designs. A total of 177 articles were reviewed. A total of 33 primary research themes and 36 secondary research themes were identified. There were 256 SAJAE authors (once count) were identified, with G H Düvel being the most prolific author. Quantitative research method was the most common with survey design. It study suggests periodic reviews of SAJAE and also comparative reviews with similar journals. Collaborative approach was suggested.

Key words: Content analysis, primary research themes, secondary research themes, prolific author, quantitative method, qualitative method, survey

1. INTRODUCTION

Historically, research for development in agriculture and extension services has been a strong driving force for meeting food supply around the world (Wesley & Faminow, 2014). The goal of agricultural extension journals amongst others is to serve as a portal for the dissemination of research knowledge and also ensure that vital information reaches many stakeholders (extension practitioners, lecturers, students, policy makers and researchers) as well. Monteiro, Devan, Soans & Jeppu, (2012) opined that research is incomplete until published. Monteiro *et al* (2012) indicate that publishing allows the authors to share with the world their original findings, reasoning, and proposed changes to several challenges encountered by the end users of research products. The desire to publish ensures that the authors keep abreast of the latest research and development within their field as this created the platform for peer recognition, collaboration, institutional recognition, career innovation and advancement and promotions (Monteiro *et al.* 2012). “The publication of academic research therefore contributes to the body of knowledge, as it reveals insights that have been formulated and contextualized scientifically” (Jordaan, Wiese, Amade & de Clercq, 2013:435). It is therefore essential to constantly review what the journals is publishing that could reveal future investigation and new approach. According to Jordaan *et al.* (2013) stock taking of the content of journals acts like a compass through which potential authors understand the direction of future investigation for publications both in content and methodology. Bush & Grant (1994) and Phelan, Ferreira & Salvador, (2002) opined that appraisals could reveal new opportunities, trends in literature, identify gaps and assist journal

³⁵ Directorate of Research Development and Innovation, Walter Sisulu University.

³⁶ Directorate of Research Development and Innovation, Walter Sisulu University.

³⁷ Directorate of Research Development and Innovation, Walter Sisulu University.

³⁸ Faculty of Natural Sciences, Walter Sisulu University.

editors developing agendas that could guide future research focus, and ultimately lead to publishing opportunities.

Content analysis of academic journals over the years has seen publications in terms of authorship, institutions represented, methodology used and themes (West, 2007; Edgar, Edgar, Briers & Rutherford, 2008). Other studies have analyzed the outputs of academic research by focusing mainly on the content of an article, its length, the various research approaches and the theory-building trends (Beaty, Nkomo, & Kriek, 2009).

The South African Journal of Agricultural Extension (SAJAE) is the scientific mouthpiece journal of the South African Society of Agricultural Extension (SASAE), established in 1966 through which it publishes research articles. The society represents agricultural extensionists involved in agricultural development mainly from South Africa has membership that spread across the globe now. And among its objectives is “to advance and apply the science and practice of agricultural extension within the research development as a scientific discipline by stimulating through study, research, discussion and publication and exchange of knowledge both nationally and internationally” (SASAE web, 2015). The articles published certainly reflect a very good sample of the best work conducted in South Africa in the field of agricultural extension, which is clear from the topics, approaches used and the distribution of study sites across the country (Academy of Science of South Africa ASSAf, 2010). SAJAE is listed as accredited journal with the South African Department of Higher Education and Training (DHET) and in the Scientific Electronic Library Online (SciELO) SA as a refereed scientific journal, in the field of agricultural extension.

South Africa (SA) is at a cliff edge, the country is at present faced with the challenges that include climate change; food insecurity, youth unemployment, land reform, and poverty remain unresolved. The situation has positioned SA at a crisis level that if left unaddressed could lead to socio economic instability. In attempt to address these issues, government over the years, has introduced policies and initiatives that include the New Growth Path (Economic Development Department, EDD 2010) and the Vision 2030 (National Planning Commission, NPC 2011). These and others are aimed at repositioning agriculture as a strategic key driver of rural economic development and job creation. As such, the NPC singled out agricultural extension as a crucial sector towards the realization of the vision 2030.

Historically, agricultural research and extension programs have been built in most of the world's economies (Everson, 2000). As noted by Wesley & Faminow (2014) the challenge for the research community is to develop resilient agricultural systems using rational, affordable strategies that not only increase production but also achieve food security for households and individuals. Hawkins, Heemskerk, Booth, Daane, Maatman, & Adekunle, (2009) reported that agricultural research has generated several kinds of technology with high potentials for impact, but the expected impact on farmers' productivity, livelihood and quality of life has not been realized. Likewise, Seck, Agboh-Noameshie, Diagne, & Bamba (2013) reported that research in developing countries has often by-passed the most needy farmers, offering solutions that are beyond their reach or simply inappropriate to their livelihoods. However, concerns have been voiced about whether future agricultural extension is actively engaged in research that is both needed and futuristic. According to Edgar, Edgar, Briers & Rutherford (2008) scholarship varies in importance, need, content, superiority, and capacity; the research created in the discipline influences the future efforts of the field. Ball & Knobloch (2005) indicated that it is critical for practitioners to examine the research base of

the practice to allow the profession to reflect upon those actions and ultimately improve the discipline. Doerfert, (2003) Tucker, (2004) and Whiting (2002) called on researchers to examine their discipline, focus research, create cohesion, and develop goal-oriented visions.

Baker, Shinn & Briers (2007) indicated the need to examine core knowledge objects and knowledge domains. Knowledge is not static and should be disseminated among scholars to solving socio and economic challenges. The expressed need to focus disciplines, examine their knowledge base, and review their literature are among others at repositioning the focus of research towards addressing complex and emerging issues in the field of study. Critical examination will allow for being sure of where we are heading with research, ensures the direction is adequate and appropriate, and if we are unclear as to where we are heading, we stop to examining our past with intention to craft better future for the society.

The main purpose of this study is, therefore, to conduct a content analysis of the articles, published in SAJAE in the last 15 years (1999-2014), with the aim of examining the primary (knowledge-base) and secondary (conceptual-base) research themes in the journal, the prolific authors, and the common research methods and designs employed by the authors.

1.1 Research Methods and Procedures

For the purposes of the study, specific journal investigation (West, 2007), which includes aspects of methodological investigation, was employed. Content analysis is a flexible, systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding (Palvia & Pinjani, 2007). It has been used as a method of analyzing written, verbal or visual communication messages using mixed methods approaches (Elo & Kyngäs, 2008). The researchers developed and set the criteria for the themes to be studied and the content of articles in the selected journals was then coded. A coding sheet was developed in order to ensure standardization and consistency of all data captured (Palvia *et al.*, 2003).

Content validity was maintained using the study of Edgar et al. (2008) as a guide and a field study to focus the research. The researchers used the authors that published in the SAJAE journal in the last 20 years with the email addresses of the corresponding author(s) extracted to conduct expert opinion poll to validate or add to research themes in the field of agricultural extension. Research theme categories were created based on previous content analyses of SAJAE published between 1999-2014. These categories were provided to the pilot study, while the respondents' were given the opportunities to compress or expound on these research theme areas. The pilot study identified 67 research theme areas for agricultural extension. A total of 136 authors identified through corresponding author(s) emails were sent questionnaire using Tailored Design Method (Dillma, 2000). Thirty-six emails bounced back undelivered and 11 out-of-office replied by machine. Only 28 (31.5%; n=89) responded to the expert opinion poll.

1.2 Sample

The South African Journal of Agricultural Extension (SAJAE) was purposely chosen as the only journal of agricultural extension publishes in South Africa. It is accredited by the South Africa Department of Higher Education and Training (DHET) and listed in the Scientific Electronic Library Online (SciELO) SA as a refereed scientific journal in the field of agricultural extension.

The research SAJAE articles from 1999 to 2014 were used as the frame for the study. The theme area classification schema that is used was based on Edgar *et al.* (2008) study; this theme category and area schema was adopted since it is rigorous due to its being based upon the views of experts in the field of agricultural extension education. The main focus of each article (knowledge-base) was coded as the primary research theme area while the most prevalent supporting theme (conceptual-base) was identified as the secondary theme of each article (Edgar *et al.* 2008)

The researchers, working separately carried out checklist for the review of each journal. Notes were then compared. Disagreement occurred mostly on coding the knowledge base and the conceptual-base themes, however, consensus were reached with the intervention of an expert in the field of agricultural extension and rural development. The agreed checklist was used to independently apply the coding.

A thorough review was made of all articles published between 1999-2014 (N = 178). Of these, 177 were identified as research articles and one conference advertisement. There were no publications for year 2010. There were no editorials, book reviews, interviews, technical notes, and position papers among the review work; only the 177 research articles were used.

1.3 Inter-coder reliability

The reliability test for the coded items was carried out using the inter-coder reliability test. Only 10% of the total articles were used for the reliability test using a systematic random sampling. Dices numbered one to ten were used. A dice was chosen randomly from shuttling bag. Dice number 4 was picked while subsequent numbers chosen were 4, 14, 24, 34, 44, 54, 64.....174. All articles with the ascribed number were used for the inter-coder reliability test. Reliability was assessed using Krippendorff's alpha. Krippendorff's alpha inter-coder agreement is considered "the most general agreement measure with appropriate reliability interpretations" (Krippendorff, 2004: 221). The reliabilities achieved from the test met or exceeded the minimum standard of 0.67 and 0.80 (Krippendorff, 2004). The reliabilities were between 0.69-0.83 falling within acceptable values.

Following the content analysis, the findings were reported using descriptive analysis.

2. RESULTS AND DISCUSSION

The study undertook the analysis of journal articles published by the SASAE in their scientific referred journal, SAJAE from 1999 to 2014. A total number of 177 articles were published between the periods for the study.

2.1 Primary research themes (PRTs)

The first objective identified the PRTs in SAJAE as shown in Table 1. There were 33 primary research themes identified. The most frequently identified PRT was diffusion and adoption of innovation (11.3%), this is followed by agricultural extension, approaches and models (9.60%); agricultural extension program and evaluation (9.04%).

Table 1: Primary research themes identified in the SAJAE 1999-2014 (n=177)

Primary research themes	(f)	%
Diffusion and adoption of innovation	20	11.30
Agricultural extension approaches, models	17	9.60
Agricultural extension program, evaluation	16	9.04
Agricultural extension management	14	7.91
Poverty reduction	13	7.34
Agricultural communication	12	6.78
Land reform	9	5.08

2.2 Secondary research themes (SRTs)

SRTs identified in the SAJAE are displayed in Table 2. There were 36 SRTs areas identified. The most frequently identified theme was Extension, personnel management, performances service delivery, organization, and motivation (11.86%). The second most frequent SRT was adoption, innovation, and technology (10.73%).

Table 2: Secondary research themes identified in the SAJAE 1999-2014 (n=177)

Secondary research themes	(f)	%
Extension, personnel management, performances service delivery, organization, motivation	21	11.86
Adoption, innovation, technology	19	10.73
Extension approach, planning, training, models,	11	6.21
Communal farming, group dynamics, communal land use	10	5.65
Farm families, farm workers, adaptation, behaviour, support, households, linkage (Small-scale and commercial farmers), transformational behaviour	10	5.65
Smallholders, skills, emerging farmers	9	5.08
Farm management, farm viability, practices,	9	5.08
Planning and implementation	3	1.70
Agricultural production, development	3	1.70
Women in agriculture	3	1.70
Continuous Professional Development (CPD) models, experience	3	1.70
Institutional factors, institutional innovations	3	1.70
Internet, mobile telephony	2	1.13
Livelihoods	2	1.13

2.3 Prolific authors

Table 3 shows the list of identified authors in the 177 journal articles of SAJAE analyzed for the study. There was no discrimination in ascribing number of published article(s) between lead and supporting authorship. All were counted with an assumption that every author contributes to the published article. There were 256 authors (once count) identified. The majority (42.93%) of the articles were written by two authors while solo-author was 28.24% (Figure 1). G H Düvel was identified as the most prolific author. He authored and co-authored 26 (14.70%) of the 177 articles (Table 3). Second in position was S E Terblanché who also authored and co-authored 21 (11.87%) of the articles.

Table 3: Prolific Authorship in the SAJAE 1999–2014 (No. of authors = 256; No. of articles = 177)

SAJAE authors	(f)	% of authors	% of articles
G H Düvel	26	10.15	14.70
S E Terblanché	21	8.20	11.86
J B Stevens	14	5.47	7.90
F S Lategan	7	2.73	3.95

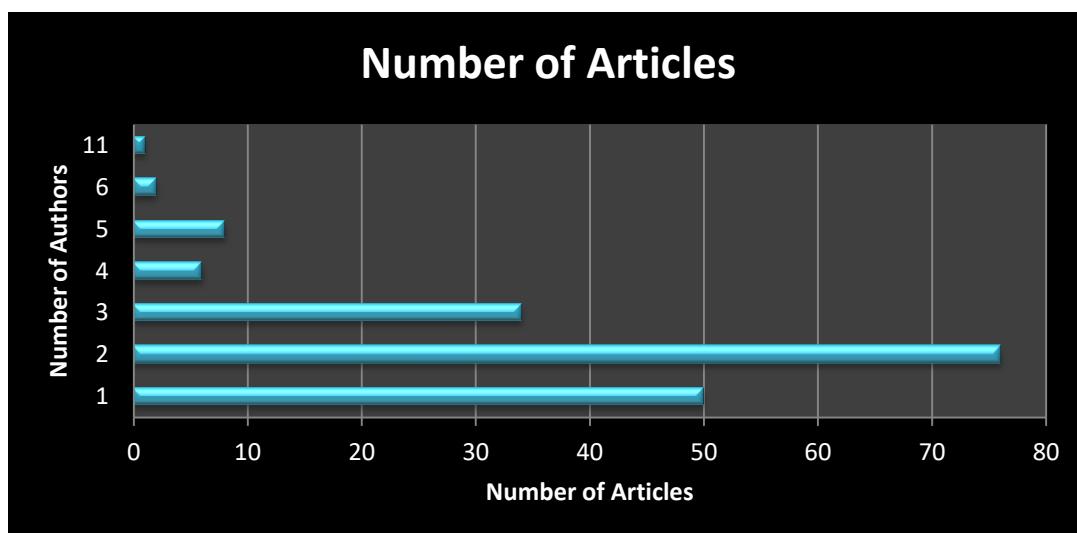


Figure 1. Distribution of articles by number of authors

2.4 Research methods

Quantitative research methods were the most common 54.8%, followed by mixed method 30.50% and qualitative 14.7%. Most (70.3%) of the mixed methods involved a combination of two methods, while others made use of multiple of more than two. There are varieties of research designs used by the authors as outlined in Table 4. The majority of the designs were surveys (57.06%) as a basic descriptive research model, followed by narrative (15.82%) and case study (5.65%). However, other research designs (ethnographical, mixed designs, experimental and action research) were also identified from the published articles.

Table 4. Research design used in the SASAE 1999–2014 (N = 177)

Designs	(f)	%
Survey	101	57.06
Narrative	28	15.82
Case study	10	5.65
Ethnographical	8	4.52
Mixed design	8	4.52
Experimental	6	3.40
Action research	6	3.40
Delphi	2	1.13
Ex Post-Facto	1	0.56
Exploratory	1	0.56
Others	4	2.30

3. DISCUSSION

One of the main findings of this study is that research is tailored along the emerging issues in South Africa after the democratic dispensation that took place in 1994. The PRTs and SRTs addressed issues proportional at addressing past institutional neglect of the black Africans. Diffusion and adoption of innovation were more researched, targeting the smallholder farmers (77.30%). Several of the articles were also researched on agricultural extension approaches, models; agricultural extension programming, evaluation; agricultural extension management; poverty reduction; agricultural communication and land reform. Most of these issues are not too different from the secondary research themes with the exceptions of themes revolving around communal farming, farm families, adaptation, households and transformational behaviour. These are issues supported by a government White paper on Agriculture released in 1995, which encapsulate the strategic transformation within the agricultural sector known as Broadening Access to Agriculture Thrust (BATAT) (Department of Agriculture, 2005). The objectives of BATAT are to design and establish mechanisms for broadening access to agriculture for previously underserved farmers in terms of their needs for financial services, human resource development, technology development, delivery systems and marketing services. This is also in line with the concepts of Terblanche (2008) as strategic to improve agricultural extension in South Africa that include; Technical competency; Communication skills; Group facilitation skills; and Extension management. Terblanche (2008:58) explained further that “research in SA clearly indicates a new concept of Extension and identifies 13 essential principles underlying any Extension approach, ranging from an educational and pro-active approach to an advisory and reactive approach”. The submission of the Academy of Science of South Africa (2010) agreed that “The content of the topics and authors of articles published in the journal reflect a high international disciplinary standing of the editorial team in that not only are the issues diverse but cover both theoretical and practical aspects”.

However, expert opinion conducted indicates two critical areas not covered by the articles as globalization and international donors. Globalization in respect of trade in agricultural commodities that must not be underestimated because of the threats it poses. Threats to production, processing and marketing that require extension guidance that leads to the formulation of appropriate trade, agricultural and rural development policies. Secondly is the growing concern among donors (Farrington, 2002) that their support should be geared towards poverty reduction. More research studies are still needed here. Other themes not covered but suggested are development ethnography, rural anthropology, agrarian reform and multiple livelihoods as important.

Three authors (G H Düvel, S E Terblanché and J B Stevens) were actually dominant in their publications as they contributed 34.46% of total articles between the study periods. G H Düvel was the most prolific writer. Collaborative studies were observed, 127 (71.76%) articles were written by more than one author. There is consensus that the quality of an article generally increases when it is done and written in collaboration with fellow researchers (Yitzhaki, 1994).

The findings of this study indicate that a majority of research in agricultural extension is survey research. This is supported by the study of Davies, Howell & Petrie (2010) of trends in research and scholarship between 1998 and 2007. The use of mixed methods by the authors in the published article was low (30.50%) indicating that relying on single method design could be a major weakness (Pisonneault & Kraemer, 1993). There is a need to

understand if current research is adding to depth and not just the breadth of research (Edgar *et al.* 2008).

4. RECOMMENDATIONS

The field of agricultural extension as a discipline that requires a paradigm shift from where it is now if it is going to remain relevant in the nearest future. There are several competing professions engaging in extension activities. The confidence imposes on agricultural extension as a catalyst towards realization of vision 2030 demands rigorous approaches to research that will impart on the community. Therefore, the study recommends periodical content analysis of published articles at every ten years to examine what we are writing, methodologies used and its impact on the society. This will assist in determine where research should focus.

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DETERMINANTS OF PASTORALISTS' SATISFACTION WITH GRAZING RESERVES IN KWARA STATE, NIGERIA.

Abanikanda, D. T.,³⁹ Ogunlade, I.,⁴⁰ Akeredolu, M.⁴¹ & Salawu, O. L.⁴²

Correspondence Author: I Ogunlade, Email: israelogunlade@gmail.com

ABSTRACT

The rising incidences of conflict between the cattle herdsman and crop farmers throughout Nigeria has become ages crises and this has led the federal government of Nigeria to designate some areas in some states as grazing reserves with the aim of solving crisis between pastoralists and crop farmers. This study examined the determinants of pastoralists' satisfaction with grazing reserves in Kwara State of Nigeria. Data was collected with the aid of structured questionnaire that was administered on one hundred and twenty pastoralists (120) randomly choose from two purposively selected grazing reserves that are functioning in Kwara State. Descriptive and inferential statistics were both employed to analyze the data collected.

The result shows that the mean age of the pastoralists is 43.68 years. All the respondents were male, majority (95%) were married and majority (96.7%) of the pastoralists had no formal education, the mean household size was nine, mean cattle owned of 106.20.. The regression analysis showed that significant relationship existed between the selected socio-economic characteristics of the respondents and their level of satisfaction with grazing reserves at 5% level of significance. The significant variables include educational level ($t=1.597$; $P=0.113$), household size ($t=1.004$; $P=0.317$), number of cattle owned ($t=0.955$; $P=0.342$) and number of cattle sold ($t=-1.501$; $P=0.136$) were positively related to the satisfaction of the pastoralists with grazing reserves. However, age ($t=0.565$; $P=0.573$), marital status ($t=0.659$; $P=0.512$) and year of pastoral farming ($t=-0.273$; $P=0.785$) were not significantly related. Based on the findings, it was recommended that the Federal Government of Nigeria should rehabilitate grazing reserve dam, provide Security for lives and properties of pastoralist, educate pastoralist to Plant improved pastures, Prevention of crop farmers from encroaching the grazing reserves in order to enhance satisfaction of the pastoralists in the grazing reserves.

Key words: Determinants, pastoralists', satisfaction, grazing reserves, socio-economic characteristics.

1. INTRODUCTION

In Nigeria, cattle production has supported the consumption of beef and milk in human diet. The rising incidences of conflict between the cattle herdsman and crop farmers throughout Nigeria has become ages crises which its implication cost Nigeria to lose more than US\$13.7 billion annually(Mercy corps report, 2015). Out of whole conflicts that transpire, the category

³⁹ Department of Agricultural Extension and Rural Development, Faculty of Agriculture, University of Ilorin.

⁴⁰ Department of Agricultural Extension and Rural Development, Faculty of Agriculture, University of Ilorin.
Email: israelogunlade@gmail.com . Phone: +23435617692

⁴¹ West Africa SAFE Coordinator

⁴² Department of Agricultural economics and Extension services, college of agriculture, Kwara State University, Malete.

that has received most attention is the conflict between pastoralists and farmers. Due to the fact that both are food producers and altogether compete for related resources (Mallam, 2004). The conflicts are caused by destruction of crops and properties by cattle by the pastoralists while burning of rangelands and blockage of stock routes and water points by crop farmers encroachment are important direct reasons cited by the pastoralists. (Adisa, 2012).

However, this has led the federal government of Nigeria to designate some areas in some states as grazing reserves with the aim of solving long crisis between pastoralists and crop farmers. These grazing reserve are piece of land that the government acquires, develops, and releases for the sedentarization of pastoralists. The state and the local governments have gazetted and obtained grazing land varying from fifty to one hundred hectares. The federal government shoulders seventy percent of the burden of developing the grazing reserves, the state governments' shoulder twenty percent, and the local government carry ten percent (Ismail 1995).

According to Babalobi (2011) 'grazing reserve is the most sustained effort at pastoral development in Nigeria, arose from a 1949-1954 World Bank review of Nigeria's Livestock sector which recommended the establishment of Grazing Reserve in major cattle producing areas is to stabilize the pastoral production method in order to utilize an area to demonstrate to the pastoralist that a sustained high level of development can be achieved free range management with modern management practices'.

2. PURPOSE AND OBJECTIVE

The purpose of this research was to examine the determinants of pastoralists' satisfaction with grazing reserves in Kwara State of Nigeria. Specifically, this study: (1) described the socio-economic characteristic of the pastoralists in the study area. (2) assessed the pastoralists' levels of satisfaction with the amenities provided at the grazing reserves and (3) identified the perceived factors influencing satisfaction of pastoralists in the grazing reserve.

3. METHODOLOGY

This study targeted pastoralists in Kwara state Nigeria and the purposive sampling technique were used in selecting respondents from two Local Governments, with current functioning grazing reserves which are Baruten and Patigi local government area of Kwara State. These two local governments purposively selected were also well known for cattle production under grazing system in the selected study area. Sixty (60) pastoralists were randomly selected from each of the two local governments, given a total sample size of 120. Survey method was used to collect data from the pastoralists with the aid of a well-structured questionnaire while descriptive and inferential statistics were both employed to analyze the data collected.

4. RESULTS AND DISCUSSION

The results in Table 1a shows that (26.7%) of the respondents fell between the age of (41-50) years while the mean age of the pastoralists is 43.68 years. All the respondents were male, majority (95%) were married and majority (96.7%) of the pastoralists has no formal education. About (46.7%) of the respondents has the household size of (1-5) with the mean of 8.92, about (35%) of the pastoralist owned 1 to 50 cattle with the mean of 106.20. About (30%) have 11 to 20 years of experience. The low level of education of pastoralist could be

attributed to non-sedentary nature of most of the pastoralist. The Federal Government of Nigeria in its efforts to attain the Education for All (EFA) goals.

This findings is in accordance with the study of (Gbolahan. et al., 2012) who reported that majority of the herdsmen have 11- 20 years of working experience.

Table 1a: Socio-economic characteristics of the respondents

Age	Frequency	Percent	Mean
20-30	20	16.7	43.68
31-40	28	23.3	
41-50	32	26.7	
51-60	28	23.3	
61 and above	12	10.0	
Gender			
Male	120	100	
Marital status			
Single	6	5.0	
Married	114	95.0	
Level of education			
No formal education	116	96.7	
Primary education	4	3.3	
Household size			
1-5	56	46.7	
6-10	34	28.3	
11-15	12	10.0	
16-20	8	6.7	
21 and above	10	8.3	

From Table 2 it shows that (50%) half of the respondents are very satisfied while (41.7%) are moderately satisfied with the size of grazing reserve this implies that size of these grazing reserves are large enough in terms of land mass to accommodate the entire pastoralists in the study area. According to Kwara state ADP The size of Lata grazing reserve in Baruten local government is (20,000Ha) twenty thousand hectares while the Okuta grazing reserve in Patigi local government (21,000Ha) twenty one thousand hectares.

Table 2: Pastoralists' level of satisfaction with the amenities in the grazing reserves

S/N	CONSTRUCTS	VS	MS	ALS	NS
		F (%)	F (%)	F (%)	F (%)
1	Are you satisfied with the size of this grazing reserve?	60 (50.0)	50 (10.0)	10 (8.3)	0 (0.0)
2	Are you satisfied with the type of pasture present in this grazing reserve?	6 (5.0)	32 (26.7)	34 (28.3)	48 (40.0)
3	Are you satisfied with the water present in this grazing reserve?	4 (3.3)	20 (16.7)	60 (50.0)	36 (30.0)
4	Are you satisfied with the extension services provided in this grazing reserve?	0 (0.0)	12 (10.0)	30 (25.0)	78 (65.0)
5	Are you satisfied with the veterinary services available in the grazing reserves?	0 (0.0)	0 (0.0)	4 (3.3)	116(96.7)

Source: Field survey, 2015

Also from the table it shows that (26.7%) are moderately satisfied with the forage pasture in the grazing reserve and (28.3%) are little satisfied while (40.0%) are not satisfied. This implies that the pastoralists will not have access to enough forage pastures in the grazing reserve and this could lead to pastoralist encroachment. Because the pasture is very important to the pastoralist, if the pastoralists are not satisfied with the pastures in the grazing reserves they could eventually vacate the grazing reserve to look for a fertile area where they can find nutritious pastures for their cattle. The reason for the shortage of pastures could be attributed to non-maintenance of grazing reserve.

According to the pastoralists in these grazing reserves, they claimed that they fed their cattle with old pastures that have been planted since the establishment of these grazing reserves, hence no new pastures were planted. Although according to (Richard, 2008) who reported that during the dry season forage and water are very scarce, whereas the duo are the major determinant's of pastoralists movements.

The table further shows that majority (50%) of the respondents are little satisfied with the water present in the grazing reserve, (16.7%) are moderately satisfied while (30%) are not satisfied. There is no manner a pastoralist can ever tolerate absence or insufficient water in a grazing reserve. The implication of these could lead to accidental encroachment of pastoralists to crop farmers' farm during the cause of search for water for cattle outside the grazing reserve.

The degree to which pastoralists' strive to get water for their livestock during the long drought season when forage pastures perpetually becomes limited and domestic animals are stressed for water and nutrients has a negative effects on cattle production. (Fred, 2012)



Figure 1: Lata Grazing Reserve Dam in Baruten Local Government Area of Kwara state, Nigeria

Source: field survey, (2015)

The Figure 1 above shows the only existing grazing reserve dam in Lata grazing reserve. Initially there were two dams in the grazing reserve; however, only one is functional. This dam serves duo purpose, it serves cattle and the pastoralist households because it is this same water the cattle drinks that the pastoralists also use for their bathing, drinking and cooking during dry season.

Furthermore, the water scarcity could also lead to conflict. According to Sunday (2013) who reported that the accessibility and availability of water are indispensable resources needed for agriculture in sub-Saharan Africa, is decreasing as a result of changes in world climatic conditions. Crop farmers and pastoralists are totally dependent on water resources to withstand their works. However, access to water currently has become more competitive than before, which has led to farmers and pastoralists conflicts on a regular basis.

The tables further revealed that majority (65%) of the respondent were not satisfied with the extension services they received from the extension agents, (25%) were a little bit satisfied and (10%) were moderately satisfied. The implication of this is that, the pastoralists in the grazing reserve will be lacking some useful information about their profession, training in the use of newly improved technology and exchange of information on problems they encountered on their work. In the long run these would have a negative effect on their economic and social aspect of life. Agricultural extension has been seen as technology or knowledge transfer by some schools of thought while another it is perceived as a human development program (Abdulwahab et al, 2013)

Moreover, the table shows that majority (96.7%) were not satisfied with the veterinary services in the grazing reserve while (3.3%) were little satisfied. This implies that if the pastoralists could not access veterinary services in the grazing reserves, there is tendency for

diseases outbreaks and rapid spreading which eventually leads to mortality and in the long run cause loss in income of the pastoralists.

The regression analysis showed the relationship that existed between the selected socio-economic characteristics of the respondents and their level of satisfaction with grazing reserves at 5% level of significance and the result showed that educational level ($t=1.597$; $P=0.113$), household size ($t=1.004$; $P=0.317$), number of cattle owned ($t=0.955$; $P=0.342$) and number of cattle sold ($t=-1.501$; $P=0.136$) annually were related to the satisfaction of the pastoralists with grazing reserves. The use of grazing reserves increase cattle milk production ($r_s=0.317$, $P\leq 0.000$), meat gained by the cattle ($r_s=0.304$, $P\leq 0.001$) gives access to varieties of pastures ($r_s=0.276$, $P\leq 0.002$), reduce cattle cost of production ($r_s=0.254$, $P\leq 0.005$), Cattle on grazing reserves are very healthy ($r_s=0.278$, $P\leq 0.002$) and prevent cattle from diseases ($r_s=0.405$, $P\leq 0.000$) were all significantly related to satisfaction of pastoralists with the grazing reserve.

Table 3: Regression analysis of the socio-economic characteristics and the level of satisfaction of the pastoralists'

Variable	B	t	P value	Decision
Constant	1.232	0.927	0.356	
Age	0.72	0.565	0.573	Not significant
Marital status	0.356	0.659	0.512	Not significant
Educational level	0.885	1.597	0.113	Significant
Household size	0.105	1.004	0.317	Significant
No of cattle owned	0.105	0.955	0.342	Significant
No of cattle sold annually	-0.141	-1.501	0.136	Significant
Years of pastoral farming	-0.28	-0.273	0.785	Not significant

$R^2 = 0.55$, $F=0.928$, $P \text{ value} = 0.488$ and at 5% level of significance.

Source: Field survey 2015

5. CONCLUSION

In conclusion, this research has brought to light the importance of grazing reserve to the pastoralists include the use of grazing reserves increase cattle milk production, meat gained by the cattle, gives access to varieties of pastures, reduce cattle cost of production, Cattle on grazing reserves are very healthy and prevent cattle from diseases. although the research has found that rehabilitation of grazing reserve dam, Security of lives and properties, Planting of more improved pastures, Prevention of crop farmers from encroaching the grazing reserves, disinfection of grazing reserve area, Artificial insemination program, Periodic vaccination program for cattle, intensive Agricultural extension services will stimulate the satisfaction of the pastoralist in the grazing reserve.

6. RECOMMENDATIONS

Based on the outcomes of this research it recommends the following: proper registration of the pastoralist using the grazing reserve should be done, construction and rehabilitation of new dams where necessary in all our grazing reserves, prohibition of crop farmers from encroaching the grazing reserve for farming in other to prevent pastoralist and crop farmer's

conflicts, Extension agencies should intensify efforts in reaching and educating the pastoralists residing in the grazing reserves.

Government should establish maternity or health center in all our grazing reserves and make provision of drinkable water for the pastoralists in all the grazing reserves.

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IMPACT OF CHANGES IN ZIMBABWEAN DEMOGRAPHICS ON SMALLHOLDER FARMING SYSTEMS: IMPLICATIONS FOR AGRICULTURAL EXTENSION.

Ndlovu, S.,⁴³ Swene, S.,⁴⁴ Tirivanhu, P.⁴⁵ & van Niekerk, J. A.⁴⁶

Correspondence Author: S. Ndlovu Email: sibongakonken@gmail.com

ABSTRACT

In the recent years, one of the triumphs of development has been ageing. People aged 60 and older make up 12.3 per cent of the global population and it is estimated that by 2050 the number will rise to 22 per cent. People are living longer due to improved health care, nutrition, sanitation, education and economic well-being in many countries. Most aged people live in rural areas and survive predominantly on farming, many young people on the other hand migrate to urban areas in search of employment. A rising number of smallholder farmers across the world are over 60 years of age is being experienced. They suffer the negative effects of climate change and high food prices. Populations are at the main issue in development therefore it is important for policy makers to understand demographics. It helps in planning resource allocation and designing of appropriate policies in agriculture which are age sensitive. This study seeks to capture the impact of demographic shift in smallholder farming and determine the potential practices that can be pursued by extension workers to reduce the effects. Qualitative data was collected and two methods were used namely: Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) from 3 wards in Nkayi district. Results showed that elderly farmers feel secluded by extension officers, suffer labour burden, till on tired soil which often requires fertilizer amongst other problems. Extension workers encouraged a change of mind set on the farmers, to leave old farming methods and adopt methods which suit the current climatic conditions. It was recommended that government policies should favour the elderly smallholder farmers for example provision of subsidised inputs.

KEYWORDS: Elderly farmers, ageing, extension workers, demography

1. INTRODUCTION

Smallholder agriculture in Africa will likely face new challenges due to the continuous shifts in the demographic structure. The continent has one of the most rapidly ageing populations in Africa. Despite the demographic impact of the AIDS epidemic, the ageing population is projected to increase over the next two decades (Makoni, 2008). Zimbabwe has had four population censuses (1982, 1992, 2002 and 2012) since its independence in 1980 and its population has almost doubled in three decades from 7.5 million in 1982 to 13.1 million in 2002 (Zimstat, 2015). The ageing population (60 years and above) has almost doubled too

⁴³ M-student, Centre for Sustainable Agriculture, Rural Development and Extension, University of the Free State, Bloemfontein 9300, South Africa. Email sibongakonken@gmail.com

⁴⁴ Lecturer, Department of Insurance and risk management, National University of Sci and Tech (NUST), Email syphoed@gmail.com

⁴⁵ Post Doc Fellow, Centre for Sustainable Agriculture, Rural Development and Extension, University of the Free State, Bloemfontein 9300, South Africa. Email ptirivanhu@gmail.com

⁴⁶ Director, Centre for Sustainable Agriculture, Rural Development and Extension, University of the Free State, Bloemfontein 9300, South Africa. Email yniekerkja@ufs.ac.za

from 366.976 in 1982 to 760.030 in 2012. Although Zimbabwe does not have the largest population of the elderly, in proportion to its small population the increase is worrying. Other countries that have large proportions of ageing populations include Nigeria (6.1%), island populations of Reunion (9.9%), Mauritius (9%) and South Africa (8.0%) United Nations (2011).

Aged persons (age 60 years and above) according to the United Nations estimates are nearly 10 percent of the world's population, or over 600 million persons and this number is expected to double by 2050 (UNFPA, 2012). Nearly two thirds of this elderly group live in the developing World. The world's elderly population is expected to rise from 606 million in 2000 to almost 2 billion by 2050, representing an increase of about 230 percent over the period (Fasina, 2013). This is not unique to Zimbabwe as indications are that; the elderly segment of the population of Zimbabwe is increasing faster than the rest of the population. This phenomenon will likely have implications for agricultural extension if they are unprepared.

This global demographic transformation has many implications to every country therefore there have been some efforts put in place to fight for the elderly. In 1982 the First World Assembly on Ageing was held in Vienna, Austria and gave the basis for the formulation of policies and programmes for ageing. In 2002, the second world Assembly on Ageing popularly known as the Madrid International Plan of Action on Ageing was held in Madrid, Spain. It encouraged commitments from Governments of attending countries to formulate and execute measures to address the challenges presented by ageing. Recommendations were also put forward for action based on three themes which are: older persons and development; advancing health and well-being into old age; and ensuring enabling and supportive environments. It was from this assembly that Zimbabwe drafted the first Older Person's bill through the then Ministry of Public Service, Labour and Social Welfare (now Ministry of Labour and Social Services) which was approved ten years later in 2012.

The elderly often receive help in form of alternative food donations and health care which is usually a short term solution to their challenges (Helpage, 2008). Most of them dwell in rural areas and depend on farming and are trailing behind in agricultural production. They are often neglected by extension officers and agricultural organisations yet they make up around 15% of the smallholder farmers in Zimbabwe. The elderly farmers did not benefit much from the land reform as most of them preferred staying on the communal farms. They are farming on tired soils which require lots of fertilizer and water therefore they need training on soil management best practices, climate change adaptation, market oriented agriculture and diversifying into other forms of farming such as piggery and poultry. Elderly farmers possess traditional knowledge which if documented could be of paramount importance to future generations for example traditional herbs for treating cattle.

Much research on livelihoods and food security in rural areas have been carried out but mostly ageing is not given attention. In fact, much focus has been on the effects of poverty on groups such as women (Amanor-Wilks, 1996), unemployed youths (Zinhumwe, 2012; Rakodi, 1995) and orphans and vulnerable children (USAID, 2006). There have been efforts however to focus on the elderly people; Chaumba (2003:66) explored how the agrarian land reform in Zimbabwe impacted the livelihoods of the aged, similarly (Mabiza, 2013) showed the turn of the retired elderly to farming as common option in Zimbabwe. Although Mabiza's case study cuts across important issues regarding smallholder elderly farmers this study will

go in depth to evaluate smallholder elderly farmers' challenges and adaptation means to the current economic, social and climatic environment in Zimbabwe.

2. AGEING IN ZIMBABWE

According to (H.A.I, 2013) elderly people in Zimbabwe are those above 60 years of age. They make up 7% of the population and most of them dwell in rural areas and are mostly female (ZIMSTAT, 2012). Ageing is a natural process and the value of older people is undisputable, their wisdom and experience is of paramount importance in Zimbabwe. A lot of issues however affect old people and interventions to fight for a convenient environment for them are necessary. Long back children would take care of their old parents but due the current economic turmoil there have been various societal shifts causing a change in living arrangements. Most adult children are in urban areas or in foreign countries and employed there but not able to send remittances to their old parents. Also common are situations where the old people are left with their grandchildren orphaned by HIV/AIDS. There is now therefore an increased number of older people living on their own and fending for themselves.

Many elderly people are forced by circumstances to work into their old age in order to for them to sustain their livelihoods. Contrary to common belief, these people actually have their lives revolving around productive activities mainly through farming. Many retire from formal employment and become communal farmers and work until they are no longer able. In a low income country such as Zimbabwe which is greatly affected by climate change and rising food prices, the ageing of farmers needs urgent action. On the international development agenda, agriculture and global food security have more prominence than any time in the past 30 years but there is almost no discussion from policy makers on the age profile of farmers.

3. CHALLENGES FACED BY ELDERLY FARMERS IN ZIMBABWE

Agriculture practices have evolved a lot over time due to many factors which include climate change, deteriorating environment and increased demand for food in the world. Elderly farmers are caught up in all the changes and have to adjust so as to be able to continue producing. Most of them farm in communal lands which have exhausted soils which require fertilizers. They depend on organic fertilizer in the form of animal waste and plant biomass which is usually not enough for their pieces of land and cannot afford buying inorganic fertilizers. Yields continuously deteriorate despite the increased demand for food. Statistics by World Bank show that about 81% of the orphans in Zimbabwe have lost both parents and are taken care of by grandparents. There is need for change in attitude and policies so that the elderly are seen as active members of the community. They are often side lined from extension services yet they also need new farming technologies so as to adapt to climate change and produce food for their families. Drought spells have in the recent years ravished their production but they have always contributed significantly to household food production in rural areas. A study conducted by Centre for Community Development Solutions in Zimbabwe also revealed that there is no inherent difference in older people's capacities to produce to food surpluses for the market and responding to cash cropping and livestock rearing opportunities.

Due to economic turmoil in the country, even the elderly who retire from formal jobs leave the city and settle in rural areas as they have very little or no pension. The retirees start another page of working life as new farmers in rural areas. Old farmers like younger ones

therefore need training on climate change adaptation, soil best management practices, marketing their products and diversifying their farming activities for example piggery, poultry or goat production. Of particular concern are the challenges of transfer of information from agricultural research centres to farmers. With the current global ICT revolution (radio, television, mobile (GSM) phone and newspaper), farmers easily access agriculture extension information on weather forecasts, market prices etc but most elderly farmers are left behind as they have little access to ICT tools and lack ability to use them. It will be good for extension agents to include the use of ICTs in their education particularly for older farmers as younger ones are used to it already.

4. OBJECTIVES

To investigate the perceived impacts of the increase in the rural ageing population on smallholder farming systems.

- To determine the potential practices that agricultural extension can pursue to reduce the impact of an increase in the rural ageing farmers in smallholder farming systems.

5. RESEARCH QUESTIONS

1. What are the perceived impacts of the increase in the rural ageing population on smallholder farming systems?
2. What potential interventions can agricultural extension pursue in practice?

6. METHODOLOGY

6.1 Site description

The research was carried out in Nkayi district in Matebeleland North Province which lies in the north western part of Zimbabwe. Zimbabwe is organised into 5 agro-ecological regions on the basis of rainfall, soils and vegetation among other factors (Vincent and Thomas, 1961) and Nkayi district is in region IV. The land resource quality declines from region I through to region V (Moyo, 2000). Nkayi district is characterised with low rainfall ranging from 450mm to -650mm and frequent seasonal droughts (FAO, 2006). Predominant soils in the area are Kalahari sands low in N, P and S and there is semi-extensive mixed livestock and crop farming systems (Masikati, 2010). It is most suitable for cattle ranching and wildlife but it can sustain drought tolerant varieties of maize, sorghum, and pearl millet and forage crops.

The district is divided into 25 wards with each ward having five to eight villages and each village comprised of mostly blood relatives and headed by a traditionally elected village head (Muzango & Munjeri, 2009). According to Masikati (2010), the district has about 150 villages and a human population density of 40 people per km². Older adults (60 years and above) in Nkayi district constitute about 7.8% of the population of the province (Zimstat, 2012) out of which 4.2% are women. Climate hazards, environmental degradation, depletion of natural resources and growing market demand have resulted in a lot of confusion and frustration on the older farmers.

6.2 Pragmatism Paradigm to the Research

Pragmatism is an action-oriented philosophy of doing research. When conducting research guided by the pragmatist research philosophy, researchers study the link between action and truth, practise and theory (Merriam, 1984). The implication of using pragmatism as a guiding

philosophy to research was that the researcher needed to view research from qualitative research perspectives. An important feature of pragmatism, when used to guide research, is that the interaction between the researcher and the participants should not be characterised by one way trends. The environment also has an influence on how human beings react to the situation.

In the context of this study, the long-drawn-out investigation emerged from the understanding that the researcher had observed that there were some gaps in the way certain practices were attempting to achieve intended objectives and hence began to doubt the view that something worked for the common good. It was from that context that the researcher attempted to acquire new facts that would lead to believing in the same order but using a cluster of supporting evidence to embrace that belief. In this study, the researcher sought comprehensive answers from respondents to the following broad question:

- What are the perceived impacts of the increase in the rural ageing population on smallholder farming systems?
- What potential interventions can agricultural extension pursue in practice?

6.3 Qualitative Research Methodology

In the collection of qualitative data, the researcher used two methods namely: Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs). The researcher led the discussions in groups with the ageing farmers from 5 villages. Each FGD consisted of 15 to 20 farmers aged 60 years and above. For interviews, the researcher interviewed 5 key informants, who were chosen on the basis of their social standing, expertise and length of time they had stayed in the district. All these respondents were in the sample.

6.4 The Population

Population, in the context of demographics of small holder farming systems in the Nkayi District, refers to the number of wards and villages in the district, as well as stakeholders such as chiefs, ward councillors, village heads, farm owners and extension workers. Nkayi District has 25 wards with a total number of 150 villages in the district. There were therefore 25 ward councillors, 150 village heads and 1 chief. It was from this general population that the researcher selected the sample that participated in this study. Cohen and Manion (1992) stated that population was a critical factor in a research study because the inquiry concerned it.

Table 1.1 Population composition of the study

Type of Population	Population Size
No. of wards	25
No. of ward councillors	25
No. of villages	150
No. of village heads	150

From this population, the researcher drew a sub-group which was specifically studied to collect information that was used to describe the impact of changing demographics in Zimbabwean small holder farming in the Nkayi district.

6.5 Sample and Sampling Procedure

In this study, two sampling procedures were used, namely random sampling and purposive sampling. A strongly designed sampling plan always contributes to both the reliability and validity of research findings. This is a view confirmed by Williamson, Karp, Dailphin, Doss, Barry & Raveis (1977), when they theorise that if sampling is done in accordance with the standard of sampling plans, it should be possible for another researcher to replicate the findings which is an important aspect of reliability.

The researcher purposely chose Nkayi District for this study because of the diversity of farms and cultures+-, a situation which could provide a true reflection of what transpires in all rural districts in Zimbabwe. In purposive sampling, researchers handpick the cases to be included on the basis of their judgement of their typicality (Cohen, Manion & Morrison. 2006).

Random sampling was used to choose 3 wards out of the 25. Within those wards, random sampling was also used to select 2 out of 8 villages in each ward to participate in the study. Village Heads, Ward Councillor and Extension Workers were drawn from the selected villages and ward respectively. Since Nkayi District has 1 Chief, he was taken in for the study.

The final sample therefore comprised the following key informants: 1 Chief, 3 Ward Councillors, 6 Village Heads, 3 Extension Workers and 1 Businessman. 6 FGDs were held, 1 in each village.

6.6 Ethical Considerations

In conducting this study, the researcher observed the right of informed consent for all participants and respondents. According to Mchad (1994), when conducting research, ethical principles of autonomy should be contained in the informed consents where the participants are allowed to choose to participate or not to participate in the research. The researcher made all participants and respondents aware of the pros-and-cons of participation. They were informed of the benefits and the risks involved and that there would be no coercion to participate in the study. Respondents were assured that confidentiality would strictly be observed and that they had the right not to respond to any questions if they felt threatened. The researcher adhered to the ethics of confidentiality, anonymity and the right to privacy.

7. RESULTS AND DISCUSSION

Data collection instruments were the Focus Group Discussions and Interviews with key informants. Qualitative data obtained from the FGDs and Interviews were compared for similarities and differences. As already stated, the research type used to collect and generate data for this study was a qualitative research study. Pragmatism as a research philosophy was used to guide the researcher to understand the phenomenon under study. to analyse the data, the researcher used the research questions as a clear guide to understand how the phenomenon was playing out in the sampled population groups and in the context of how the participants described the reasons for the lack of interest in giving the ageing farmers attention in the Nkayi District.

7.1 Interview sessions with Key Informants

The interview sessions sought to find out the views from key informants on the impact of demographics on small holder farmers. The following were the main views from respondents:

- Agriculture extension workers admitted to being somehow reluctant to give attention to elderly farmers as most of them have detached from local farmers activities such as meetings and field days. They said the best solution will be to make sure that elderly farmers are informed in time about any activities happening so that those able attend.
- The respondents also cited that they will have special meetings with elderly farmers especially about the importance of use of ICTs. Important information like weather forecast, awareness of disease outbreaks, market prices and input prices is likely to be out of reach for anyone without a mobile phone, radio or television. Extension workers in Zimbabwe face situations whereby they are allocated a huge number of farmers that are in separate wards which are far from each other. Due to limited resources they have difficulties attending to farmers far from their respective stations therefore use of ICTs has been of great help in communicating. Most elderly farmers particularly women hardly ever use any means of ICTs despite most households owning mobile phones and radios. There is therefore need for change of mind sets so that all farmers particularly the elderly adjust so that they are not left behind or miss out on important agricultural issues.
- Agriculture extension workers face a challenge that most farmers are not willing to let go off old methods that worked long back. They say despite all the talk about climate change and change of seasons, farmers still plant around the same time they used to
- Extension workers also encouraged elderly farmers to intensify their farming on smaller pieces of land that they can manage and employ recommended technologies to manage soil fertility for example conservation farming.
- Extension workers however made it clear that they lack resources to execute programs that could be helpful for the elderly community. They no longer have any means of transport except to walk or cycle but some of the farmers are too far from their stations thus hardly attend them. Some still have motorbikes but there is no fuel provided for them which limits their mobility.
- Agricultural colleges and institutions in Zimbabwe need to develop a new curriculum that is in line with modern technology used in farming for example ICTs because extension workers agreed to having a challenge in that area. They learn the technical side of agriculture extension where only production is emphasised but empowering the farmer on marketing the product is a little overlooked.

The second part of the interview meant to spell out the potential interventions that agricultural extension pursues in practice. The discussion yielded the following results:

1. ICT's

- The disproportionate ratio of extension workers to farmers is the main challenge preventing effective exchange and transfer of knowledge to inform smallholder farmer's decisions for different commodity supply chains, weather forecast and pest and disease outbreaks amongst many important issues in agriculture. In this modern world ICTs continue to expand and there are ways that have been developed to harness ICTs for improved delivery of extension services. Agricultural Extension and Technical Services (Agritex) has in the past years relayed information through wide coverage in main radio stations however this has since been overtaken by emergence new technologies which are faster and more efficient. Despite the economic challenges that the government departments are facing there is urgent need to invest in ICTs. Agritex is working on an SMs platform to deliver pre-planting, growing,

harvest and post-harvest information on selected crops. Other platforms such as eMkambo and Zimbabwe Farmer's Union (ZFU) bulk SMS, newsletters and emails have been effective in getting information to farmers. This will serve as a good solution to elderly farmers who can no longer walk long distances to meetings and training programs organised by extension workers, luckily most if not all elderly farmers have mobile phones that they use to communicate with their children in urban areas or beyond borders.

2. Market access

- The smallholder elderly farmers complained that the main hindrance to an improvement to their livelihoods has been lack of markets. They do not have an understanding of markets and the standards required from their produce, they also have limited business and negotiation skills thus often exploited by buyers. Elderly farmers are at a disadvantage as they lack exposure and strength to look for buyers. Extension workers in Nkayi district want to start linking elderly farmers with reliable markets especially for cattle which are their most valued investment. Extension workers must not only link them to markets but also educate them on farming as a business, market prices, negotiation skills and producing quality that meets market standards.

3. Growing resilient crops and adaptable varieties

The incidence of food crisis in Nkayi District has become common due to adverse weather conditions. One of the interventions suggested was use of resilient crops like sorghum, pearl millet and finger millet as an alternative of maize (staple crop). Poor yields of maize have experienced in the recent years as it cannot withstand erratic rains. Extension workers pointed out that they often face challenges with elderly farmers as they usually have fear of trying out new practices therefore most of them stick to maize only despite disappointment year after year.

4. Capacity Building of Elderly Farmers

Extension workers resolved to dedicate more time to the elderly farmers in all the different wards so that they also stay in touch with current agricultural technology and changes. They will start having meetings arranged particularly for to empower them with the above mentioned interventions.

7.2 Focus Group Discussions with ageing farmers

Farmers aged 60 years and above were interviewed in Ward 10, 14 and 15.

The first question sought to find out the impacts of the increase in the rural ageing population on smallholder farming systems. The discussion yielded the following results:

Social Factors

- Older farmers expressed concern on increased labour burden as their children migrate to urban areas and neighbouring countries in search for jobs. They mostly remain with the young grandchildren who are of school going age and usually not capable of working in the field. Most of them said that they have even reduced their farming area because they are no longer able to work on large pieces of land. They hardly hire labour as they do not have means to pay them.

- They complained that their children work low paying jobs in the urban areas or outside the country particularly South Africa therefore they hardly receive remittances. Even if they receive remittances the money is only enough to pay school fees for their grandchildren and buy stationery and food, it is not enough to buy agricultural inputs and it's reducing their productivity in terms of agriculture. They use retained seed and organic fertilizer usually cattle manure and it only covers small portions of their land.
- Elderly farmers are often not incorporated into programs by extension workers despite the fact that there is so much they want to learn especially in terms of climate change. Many times extension officers call meetings at places that are afar off and elderly farmers are not able to attend. They also pointed out that sometimes they are incorporated into programs but the younger vibrant farmers overpower them in many ways e.g during input distribution or any decisions made in the group. They actually suggested that extension workers separate them from younger farmers so that they benefit from the programs.
- Elderly farmers said they still use their indigenous knowledge for many of their farming activities for example treating broken limbs in livestock, preserving stored produce and getting rid of pests in crops. They said they find traditional methods effective and saving them from costs of buying "fancy" medicine and chemicals. They said they would encourage extension officers to document the knowledge as it has been used successfully through generations. They said agricultural extension and veterinary offices are far from some villages therefore indigenous knowledge has often helped them deal with minor problems.
- Information and Communication Technology (ICT) is also another area that elderly farmers said needed to learn about. Younger farmers benefit from ICTs as they are able to get updates on produce market prices, weather forecast, disease outbreaks and messages from extension workers. Most elderly farmers have a mindset that has not adapted to the new era.

Ecological Factors

- Elderly farmers said that their farming land was tired and now low in fertility. They use organic fertilizers (cattle manure) which is usually not enough to cover the areas being farmed. Other means of managing soil fertility include fallowing the land for some time and then ploughing it again. They also rotate legumes with cereals to capture nitrogen released by legumes. The lack of sufficient fertilizers was said to be the biggest setback and has resulted in reduced yield.
- Climate change which has resulted in change of seasons and rainfall amount is another worrying setback. Elderly farmers said they need to be taught by extension workers on how best to cope under such conditions. They said in the past four years they have had pathetic yields as they plant at wrong times and then face mid-season droughts.
- Some of the strategies they implement to mitigate climate change include staggering planting dates to spread risk. Some said they have also resorted to using hybrid seed whilst most of them said they still use retained seed which is long seasoned because of lack of money to buy hybrid seed. They expressed concern about the need for more knowledge on this topic as they feel it's important

Economic Factors

- Farmers agreed they have never attempted getting bank loans and have no knowledge of how to go about it, They said they have practised contract farming for cotton and prices went down that particular year and did not end well.
- One of the major farmers which farmers felt they need help in is being linked to markets. They say sometimes they produce but have nowhere ideal to sell. In Ward 10 farmers say they once grew coffee and produced a lot of it only to end up throwing away because they never got the market for it.
- Due to lack of market they are often exploited mostly by cattle and goat buyers that end up buying at very low prices. Many buyers often complain about the poor quality of the produce or livestock therefore farmers need to learn to produce acceptable quality so as to get desired market prices.

Elderly farmers' perspectives on what needs to be done to mitigate the challenges

- Elderly farmers' perspectives on what needs to be done to mitigate the challenges
- The elderly farmers in all wards said they wish they could have projects that give attention only to them for example nutrition gardens.
- They would prefer to have the extension officers give them attention as elderly farmers and organise meetings specifically for them for example on coping with climate change, market prices and advice on how to sell their cattle and linking them to markets. They also said they would like to learn more on ICTs and how they can use them to their advantage in farming.
- Elderly farmers also expressed concern about younger farmers who work in their fields on sacred resting day which is Thursday. They said they also suspect it's another reason the rains have become erratic!

8. CONCLUSION AND RECOMMENDATIONS

The demographic shift which has seen an increase in older adults (60years and above) is having implications on smallholder farming. They depend on farming for livelihoods and therefore a lot of work needs to be done by extension workers to make sure they keep producing. This study therefore clarified what challenges smallholder elderly farmer face and what interventions can extension workers pursue to assist in the mitigation.

Recommendations for involved parties are as follows:

Elderly farmers

Elderly farmers should not segregate themselves and neglect gatherings such as trainings and workshops that other farmers attend. In cases where they cannot go because of distance, they should make sure they get information that was shared from other farmers so that they stay in touch with activities in their community. They should also be willing to let go off old ways that they used when they started farming for example planting dates and crop varieties so as to adapt to the current climatic conditions being experienced. Elderly farmers should also improve on their use of ICTs in agriculture as this can improve their means of communication with their extension officers.

Extension staff

Extension staff has a role to full-fill in educating and monitoring elderly farmers and never to ignore them because of age and still contribute to food production in the country. They should also document indigenous farming knowledge which elderly farmers use for example in treating sick animals or controlling pests and disease.

Government

Government policies that favour elderly farmers should be put in place which may include subsidised inputs and lifting of taxi paid for livestock. Currently there are insufficient extension workers, they are faced with an overwhelming workload thus fail to attend to so many farmers. The government must make plans to deploy more extension workers to ensure an effective extension system and provide them with means of transport such as motorbikes.

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50TH COMMEMORATION DAY PRESENTATIONS.

2nd Day of Conference, 7 June 2016

THESE PRESENTATIONS IN MS POWERPOINT AND MS WORD FORMAT ARE INCLUDED IN A SEPARATE FOLDER ON THE CD. THE FOLDER'S NAME IS:

2ND DAY PRESENTATIONS.

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IMPLEMENTATION EVALUATION OF THE EXTENSION RECOVERY PLAN.

Ngomane, T.⁴⁷

ALTHOUGH THIS PRESENTATION WAS THE FIRST ONE ON THE LAST DAY (8 JUNE 2016) IT IS INCLUDED IN THE SAME SEPARATE FOLDER ON THE CD. IT IS A PDF FILE. THE FOLDER'S NAME IS:
2ND DAY PRESENTATIONS.

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⁴⁷ Outcome 7 Facilitator, Rural Development: Department Planning, Monitoring and Evaluation, Presidency.
Email: Tsakani@dpme.gov.za

IMPROVING AGRIBUSINESS OF EMERGING SMALL SCALE FARMERS THROUGH GOOD MANAGEMENT PRACTICES IN PLURALISTIC ADVISORY SYSTEMS.

Swanepoel, J. W.,⁴⁸ Van Niekerk, J. A.⁴⁹ & Blum, M.⁵⁰

Correspondence Author: J A van Niekerk, Email: vnierkerkja@ufs.ac.za

ABSTRACT

The Department of Agriculture of the Western Cape is at the forefront in the quality of extension and advisory services provided on the African continent. The main aim of this study was to investigate and document the management practices and enabling factors employed by the Western Cape's Department of Agriculture which contribute to the successful implementation of extension and advisory services. The study employs a mixed-methods design, and consists of three phases, two of which have been completed and are reported on here. The first two phases consisted of an investigation into good management practices and enabling factors from the perspective of extension advisors and managers working in the Department of Agriculture of the Western Cape. The final sample consisted of 54 agricultural advisors and 7 participants employed in various management positions in the Western Cape's Department of Agriculture. Results does not only highlight the importance of individual management practices such as strict adherence to norms and standards and collaboration with public, private and commodity partners, but also brings to light the positive impact of the combination of good management practices being employed in the Department. Factors examined include strategic management, organizational structure and performance management, collaboration between the public and private sector, human resource management, functional and geographical repositioning of staff, and management's design and implementation of innovative Information and Communication Technology systems.

1. INTRODUCTION

Since the collapse of the Training and Visit system research and extension systems were reformed and restructured around the world (Anderson, Feder, & Ganguly. 2006). The Department of Agriculture in the Western Cape was successful in designing and implementing various innovative management practices, resulting in the Department being at the forefront in the quality of extension and advisory services provided not only in South Africa, but also on the African continent. This is evident from the success of land-reform farmers in the province, a sector very much dependent on the quality of extension and advisory services (Western Cape Department of Agriculture, 2015). The Food and Agriculture Organization (FAO) in Rome, in collaboration with the Centre for Sustainable Agriculture, Rural Development and Extension of the University of the Free State in South Africa, set out to identify and document the management practices implemented for extension and advisory services in the Western Cape, with the aim of putting together a set of guidelines for the improvement of extension and advisory services in other Provinces in South Africa, and ultimately also in other countries in the developing world.

⁴⁸ University of the Free State. Email: swanepoeljw@ufs.ac.za

⁴⁹ University of the Free State. Email: vnierkerkja@ufs.ac.za

⁵⁰ Food and Agriculture Organization. Email: magdalena.blum@fao.org

Management can be defined as all processes and systems of an organization that ensures the efficient use of organizational resources to achieve the organization's aims and objectives (UNIDO, 2010). It has been found that a company's indicators of good management and performance correlates strongly with measures such as productivity, return on capital and survival of the firm. In effect, good management can shape organizational performance (Bloom, Sadun & Van Reenen, 2012). There are several interrelated key elements that influence management. One of these elements is strategy, which is in turn influenced by the vision and mission of an organization, strategy formulation control, transparency and accountability within an organization (UNIDO, 2010). The vision and mission of an organization forms an essential part of the strategic management process (MacDonald, 2011), and can be defined as the organization's primary goal and objective, whereas the strategy is the plan that is put in place in order to reach this goal (UNIDO, 2010). A clearly defined vision and mission results in a strategy that can be converted to a work plan with binding responsibilities, time allocations and deadlines, all in line with the company goals for the long term. This operational strategy can then be implemented, monitored, evaluated and revised if needed (MacDonald, 2011, UNIDO, 2010), all the while contributing to the successful running of the organization.

Other factors that have been found to play a role in management, and then particularly in operational management, are operational planning and leadership, the organization of staff, coaching, communication, controlling, finance management, ethics and integrity in the organization. Ethics and integrity fosters staff respect and optimises work atmosphere (UNIDO, 2010). Furthermore, positive engagement with stakeholders, public relations, networking as well as excellent external communication also contributes to good management (UNIDO, 2010). Government might not have the full capacity to afford a specific project or the expertise to deliver all the services required to reach long term goals. The process of procurement serves as a way to cross subsidize to provide government services (Quelin, 2015). Public-private partnerships are the best way to overcome financial and skills shortages.

At the employee level, the establishment of a staff cohort with expertise in their respective fields is also recognised as a management practise that greatly adds to an organization's success, with one of the key factors here being the management of knowledge within the organization (UNIDO, 2010). Michelman (2004) gives four strategies for managers to implement regarding employees, namely selection, expectation setting, motivation and development. Firstly, when staff selection is considered, managers should select people for their talents and not just for skill. Buckingham & Coffman (1999) defined talent as a pattern of thought, feeling and behaviour that can account for the difference in results seen when workers with the same training and skills are compared. Managers should seek an employee that will redefine how the job is done. In terms of expectation setting, managers should define the outcome and let each employee define the steps to achieve the outcome by using their individual talents. The focus is the outcome, and the outcome should not be obscured by the steps. (Michelman, 2004). The third management tool stated by Michelman (2004) is motivation. A great manager must emphasize the unique strengths of each employee and find strategies to improve their weaknesses, whilst taking advantage of what employees are able to do well already.

Bloom *et al.* (2012) researched the implementation of good management practices in organizations and found that many organizations are badly managed especially with regards

to the setting and monitoring of targets. Many firms do not set targets, they do not base compensation on the meeting of said targets and they do not constantly measure their results. In line with this is the finding that one of the three core principles of best management practices is the setting of targets, with the other two being the monitoring of targets and the giving of incentives (Lipman, 2013, Bloom *et al.* 2012). Bloom *et al.* (2012) suggested that an organization should aim to reach targets through supporting long term goals with short term benchmarks of performance. Performers should be promoted and underperformers should be retrained or moved (Bloom & Van Reenen 2007). The analysis of performance data will provide a means to identify areas where improvement is needed (Bloom *et al.* 2012), thus forming the second core best management principle, the monitoring of targets. For the third core best management practice, the giving of incentives to employees, Sprint (2013) suggests that HR departments can implement incentives and rewards as a strategic part of remuneration. These incentives are a way to retain key talent for the firm, and may include year-end bonuses, retention bonuses, sign-on bonuses, profit bonuses as well as spot bonuses. The use of non-monetary rewards can include additional time off and giving public recognition to employees for achievement in their work (Spring, 2013). Lipman (2013), on the other hand, suggests designing the economic incentives so that all employees from all levels of the organization could potentially benefit from the incentives. Feedback should be provided frequently and constructively. Providing adequate training and emotional support in times of need will positively influence employee loyalty (Lipman, 2013). Key performance indicators may be used during the process of performance tracking.

Research has shown the implementation of the above three core management practices by organizations leads to large improvements in profitability and productivity, improved growth and longer survival than firms in control groups that do not adopt these practices (Bloom, Eifert, Mahajan, McKenzie, & Roberts, 2011). When a five-point management score created by Bloom, Sadun & Van Reenen was implemented by firms, a one point increment was associated with a 23 % increase in productivity (Bloom *et al.* 2012).

That said, there are plenty of speculation on why seemingly identical firms in the same sectors could exhibit such varied performance in regards to productivity. The better measures of input like capital, materials and skills can be measured in economic research and the productivity differences thus eliminated (Bloom *et al.* 2007). Technology could account for some of the improved performance. Panel data econometricians label the unexplained productivity differential as the fixed effects of “managerial quality”.

Taking the above discussion into account, the main aim of this study was to test which of the management practices mentioned here was also seen as important, by both managers and agricultural advisors, to the success of extension and advisory services as implemented by the Department of Agriculture of the Western Cape.

2. METHODOLOGY

2.1 Study design

In order to answer the research questions effectively, a mixed-methods case-study framework was utilised, incorporating an exploratory sequential design. Within this design, semi-structured in-depth interviews, analysis of existing data, policies and structures, fieldwork visits and consultations with primary stakeholders were conducted in order to identify and evaluate the management practices that were implemented, as well identify the factors enabling their successful implementation. The qualitative data thus obtained was then used to

inform the development of surveys consisting mainly of quantitative rating scales, which enabled management and agricultural advisors to evaluate the identified management practices.

2.2 Measuring instruments

Two separate questionnaires were designed for the purposes of this research, one each for the management team of the Department of Agriculture of the Western Cape and the agricultural advisors. All questionnaires consisted primarily of quantitative questions, but were supplemented by open-ended qualitative questions to verify quantitative responses. The questionnaires all consisted of questions regarding management practices, but were tailored for each subgroup in order to ensure relevance. For the purposes of triangulation of responses between the subgroups, questions were repeated for each subgroup whenever possible.

2.3 Sampling

This study made use of two different sampling techniques:

- For the managerial sample, a non-probability purposive sampling technique was used. Individuals representing the management of the Department of Agriculture of the Western Cape were seen as experts in the area studied, and were asked to complete the questionnaire designed specifically for management.
- For the agricultural advisors, a non-probability convenience sampling technique was employed. All agricultural advisors in the Department of Agriculture who were willing to complete the questionnaire created specifically for them were given a questionnaire to complete.

2.4 Study phases

The research questions required the study to be broken into three phases, each phase informing consequent phases.

Phase 1: During this phase, interviews with the management team of the Agricultural Development and Support Services section of the Department of Agriculture in the Western Cape, as well as a focus group with the agricultural advisors employed by the Department, were conducted in order to ascertain the management practices that were successfully implemented, as well the enabling factors in the environment making their implementation possible. Documentation from the department was also scrutinized to verify the information gained from management and the agricultural advisors.

Phase 2: The qualitative data gained from phase 1 was used to design two sets of questionnaires: one for management, and one each for the agricultural advisors and farmers. These questionnaires consisted of both quantitative questions and open-ended qualitative questions verifying the quantitative responses, and provided a means by which management, and advisors could further evaluate the identified management practices.

Phase 3: Data received back after the completion of the questionnaires was analysed together with the qualitative data obtained in Phase 1. This was done in order to evaluate the effectiveness of the management practices implemented from the perspective of management and the agricultural advisors, as well as to identify the enabling environment created by the

management team of the Department of Agriculture of the Western Cape that enabled the successful implementation of the identified management practices.

2.5 Demarcation

The study took place in the Western Cape Province of South Africa. Primarily due to physical resource differences, the Western Cape's agricultural sector is unique from other provinces in South Africa. The winter rainfall region of the Winelands and the year-round rainfall of the Southern Cape enable the cultivation of a unique variety of crops, and greatly enhance the production potential of the area.

2.6 Data analysis

Quantitative and qualitative data were obtained during the first two phases of this study. A mixed methods approach was employed to analyse and interpret the information. Descriptive statistics were used to analyse all quantitative responses in the surveys. Within each subgroup of participants (managers and agricultural advisors), the open-ended qualitative responses were coded, quantified, and finally triangulated with the quantitative responses as a means of verifying quantitative answers.

3. RESULTS

3.1 Demographic information

The final sample consisted of 54 agricultural advisors and 7 individuals employed in management positions in the Western Cape Department of Agriculture. The gender distribution of the sample was somewhat skewed, with more males than females for both managers and advisors, although females were well represented in both groups (Figure 1). Since nearly all agricultural advisors employed by the Western Cape Department of Agriculture completed questionnaires, this is a true representation of the gender distribution among agricultural advisors in the Department⁵¹.

⁵¹ Due to the existence of missing data and "Select all that apply" questions, percentages in the graphs in this report will not always count up to a 100%.

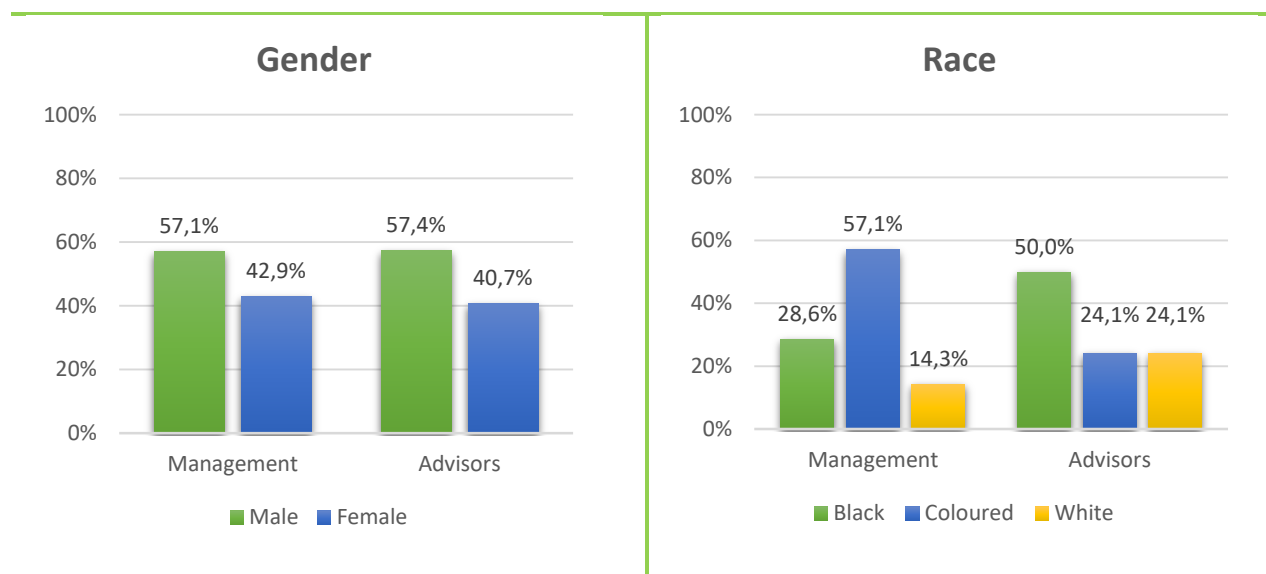


Figure 1: Gender and racial distribution

Regarding the racial distribution of the sample, half of the advisors were Black/African, whilst the remainder were either Coloured (24%) or White/Caucasian (24%). Managers were mostly Coloured (57%), with the remainder being either Black (29%) or White (14%) (Figure 1).

The vast majority of advisors (85.2%) fell between the ages of 30 and 49 years old. All managers were 30 years or older, with the majority (57.1%) falling in the 40 to 49-year age range.

3.2 Qualifications and experience

In line with the National Norms and Standards for Agricultural Advisors (National Department of Agriculture, 2005), more than 90% of the advisors in the department are educated to NQF level 7 or higher, with a third of the advisors qualified to Master's level, a third qualified to honours level, and a third holding Bachelor's degrees. All managers hold at least a Bachelor's degree, with nearly half (43%) educated to Master's level (Figure 2).

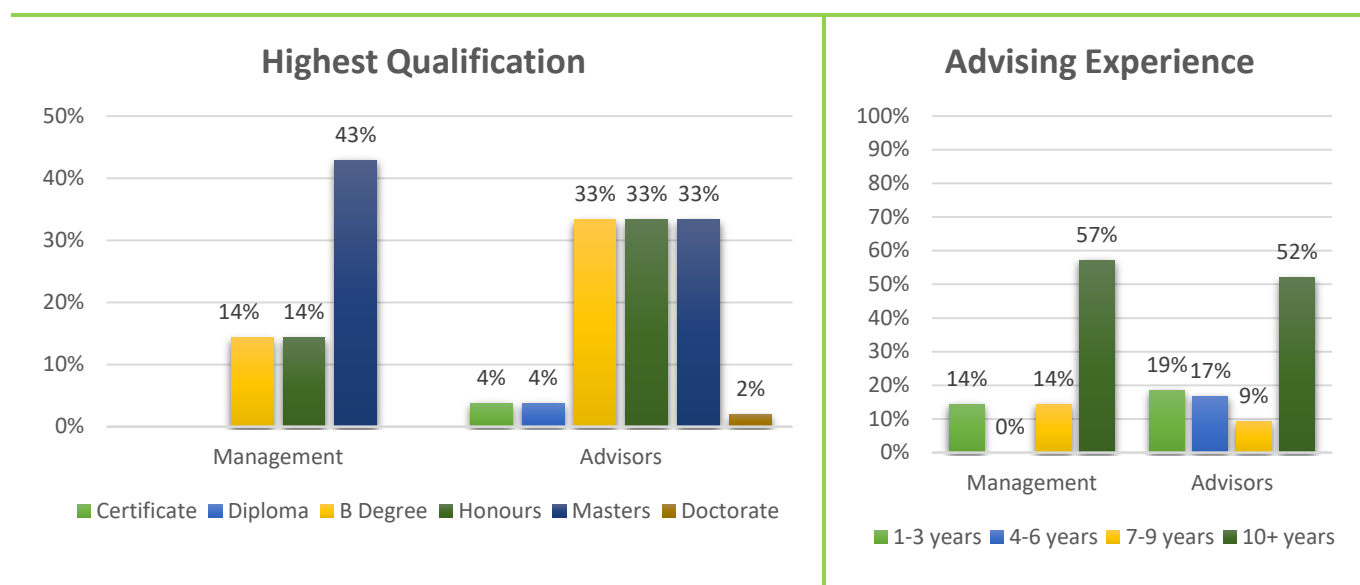


Figure 2: Qualifications and experience

In addition to being highly educated, both advisors and managers in the Department are also experienced in their field. Half of the advisors and 57% of managers indicated that they have 10 or more years' advising experience (Figure 2). This finding is in line with the assertion that staff with expertise in their respective fields is crucial for the success of an organization (UNIDO, 2010).

3.3 Area of focus and primary target group

Advisors mainly give advice in the areas of vegetable production (72% of all advisors), sheep farming (59% of all participants), goats (54% of all participants), and piggery (50% of all participants). Due to financial and resource constraints, the Western Cape Department of Agriculture took a decision to not focus on all commodities stipulated at National level, but instead selected a number of economically competitive commodities to focus on. Apart from goat farming, all the focus areas identified by a high number of agricultural advisors in this study correspond with the focus areas identified by the Department.

Within these focus areas, advisors primarily serve smallholder farmers (90.7%), subsistence farmers (85.2%) and emerging farmers (72.2%). In addition, 42.6% of the advisors indicated that they also provide advisory services to commercial farmers. Regarding the types of services provided, the vast majority of advisors indicated that they provide advice on farm management (92.6%) and production (87.0%) at least once per quarter. In addition, more than three quarters of advisors indicated that they provide advice on marketing (77.8%), advice on how to strengthen resilience (75.9%) and assistance to farmers in applying for funding (79.6%), at least once per quarter (Figure 3).

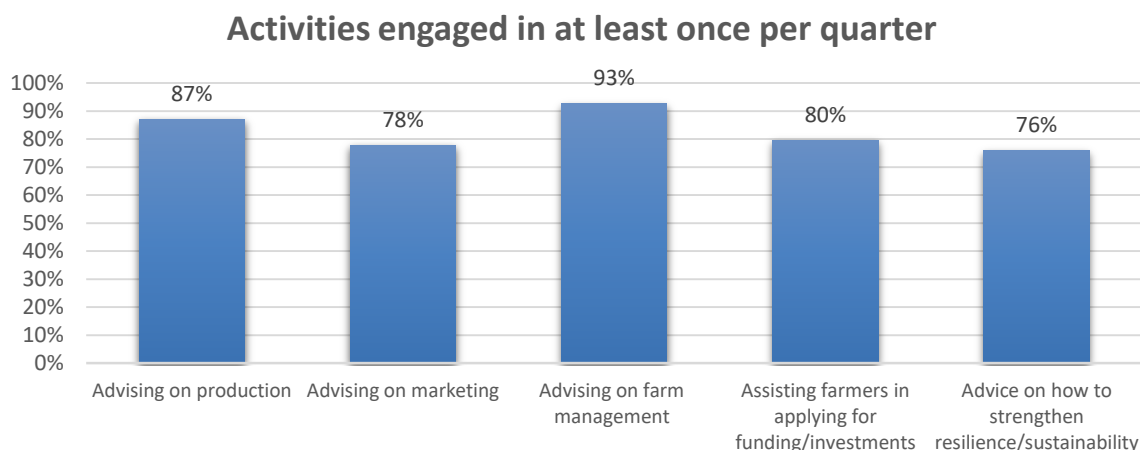


Figure 3: Activities engaged in

3.4 Strategic Management

3.4.1 *Defining the Mission and Vision statement*

The Department of Agriculture of the Western Cape has set the following vision statement: “The department is primarily responsible for the promotion of agriculture in all its rich diversity in the Western Cape. We are striving towards being a united, responsive, prosperous agricultural sector in balance with nature.”

Agricultural advisors were asked to what degree different levels of staff participated in the design of the Vision and Mission Statement. From the responses it became clear that participants’ level of appointment is directly related to their degree of participation, with participation increasing markedly for more senior positions. More specifically, the Head of Department (HOD) is seen as having played the greatest role, with 87.0% of advisors indicating that she played a role either to a certain extent, or to a large extent. Apart from the HOD, over 70% of advisors indicated that the Chief Director, Minister, Deputy Director General and Director General also played an important role in the development of the Vision and Mission Statement.

Advisors and management were very positive about the mission statement, the vision statement and the strategic objectives of the Department, with over 85% of advisors, and all participating managers, indicating that they agree to some extent with these three departmental objectives (Figure 4). As noted, the mission and vision of an organization is essential for the proper strategic management of that organization (MacDonald, 2011). The high levels of agreement with the Department’s mission and vision by both management and advisors is a clear indicator that the Department is strategically on the right course.

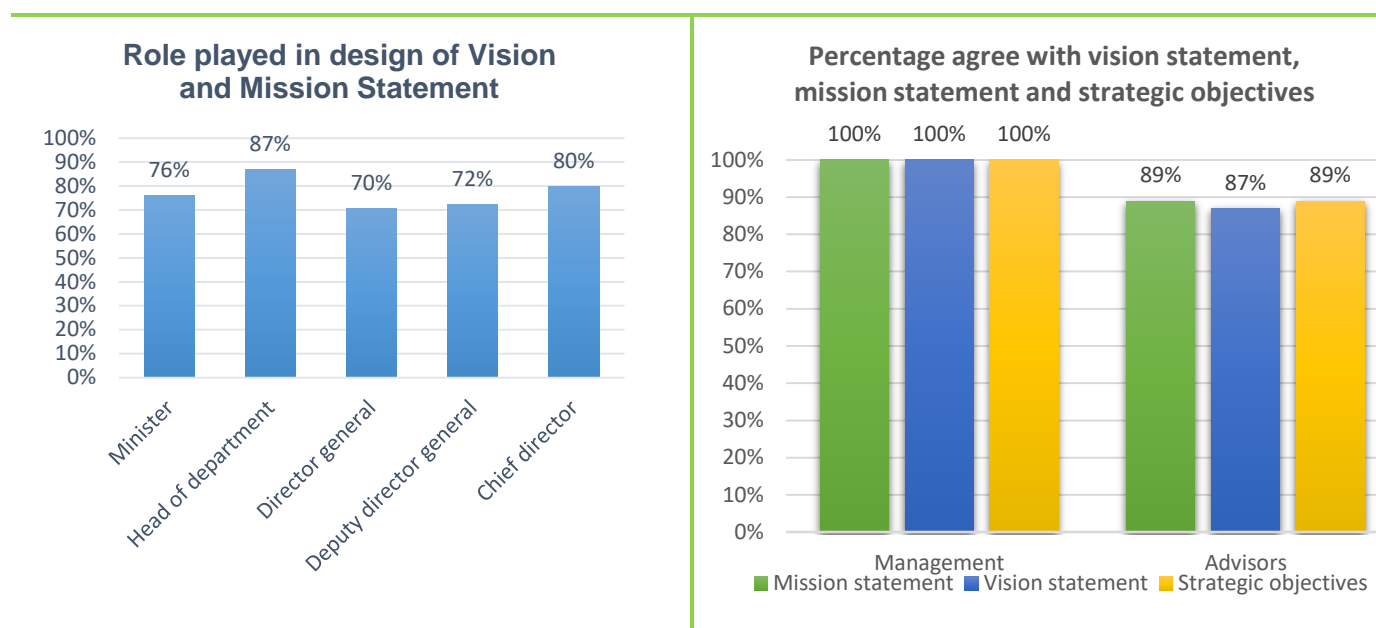


Figure 4: Mission and Vision

3.4.2 Setting and monitoring of strategic objectives and targets

The advisors' involvement in target revision is limited, with the majority indicating that they were either not involved at all (35.2%) or only somewhat involved (25.9%). In addition, the majority of advisors feel that farmers either know about the targets, but don't know what they are (40.7%), or only know some of the targets (24.1%).

That said, 87% of advisors and all participating managers agreed that the targets are known and understood by those who contribute to it. Further positive sentiments regarding the set targets were also evident from the data. Both advisors and management agreed that the time scale set for reaching targets are sufficient (100% of management and 61% of advisors), that the targets are realistic and can be reached (71% of managers and 74% of advisors), and that they have the appropriate means available to reach the targets (71% of managers and 70% of advisors) (Figure 5). It is evident from these findings that the Department has a healthy and functional system around the setting and meeting of targets, a factor widely considered as a core element of good management practice (Lipman, 2013; Bloom *et al.*, 2012).

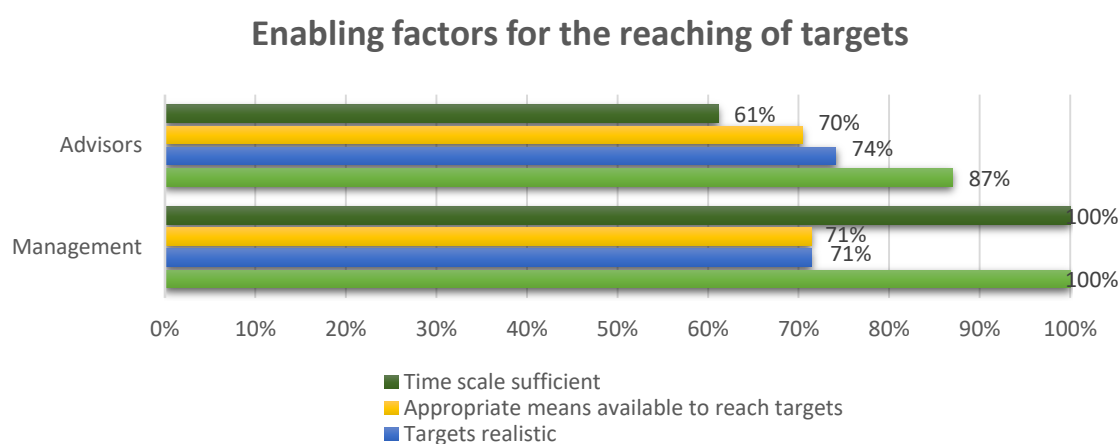


Figure 5: Reaching targets

The monitoring of progress towards reaching set targets is also seen as a crucial element in the successful management and running of an organization (Lipman, 2013; Bloom *et al.* 2012). In the Western Cape's Department of Agriculture, internal monitoring of targets seems to occur most frequently, with 87% of advisors indicating that this happens either once per quarter or once per month, whilst external audits of targets mostly occur once a year only. Programmes are evaluated less frequently than targets, with the majority of advisors (59.3%) indicating that the internal evaluation of programmes occurs once every six months or once per quarter, whilst their external evaluation occurs once per year or once every six months (53.7%).

Impressively, 89% of advisors either reached their targets in 2015 (66.7%) or had results that were above their targets (22.2%) (Figure 6).

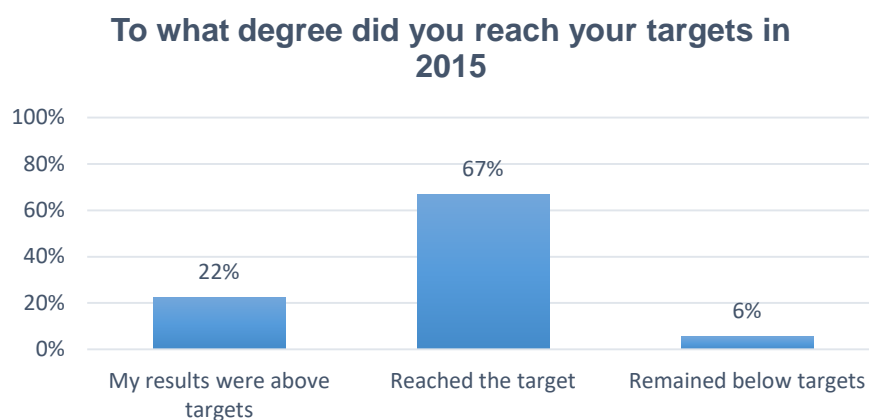


Figure 6: Targets reached 2015 1

Given this high rating, managers and advisors were asked to highlight aspects which contribute to the reaching of strategic goals and targets. The commitment of staff, including that of the management team, supervisors and advisors is seen as especially important to the reaching of targets, with more than 88% of advisors and at least half of managers rating each of these aspects as making an important contribution. In addition, the monitoring of both target indicators and staff performance are seen as contributing factors, with over 85% of both managers and advisors rating monitoring as important to the reaching of goals and targets. Finally, advisors and managers emphasised the impact of the qualifications of advisors on reaching goals and targets, with all managers and 94% of advisors rating qualifications as especially important (Figure 7).

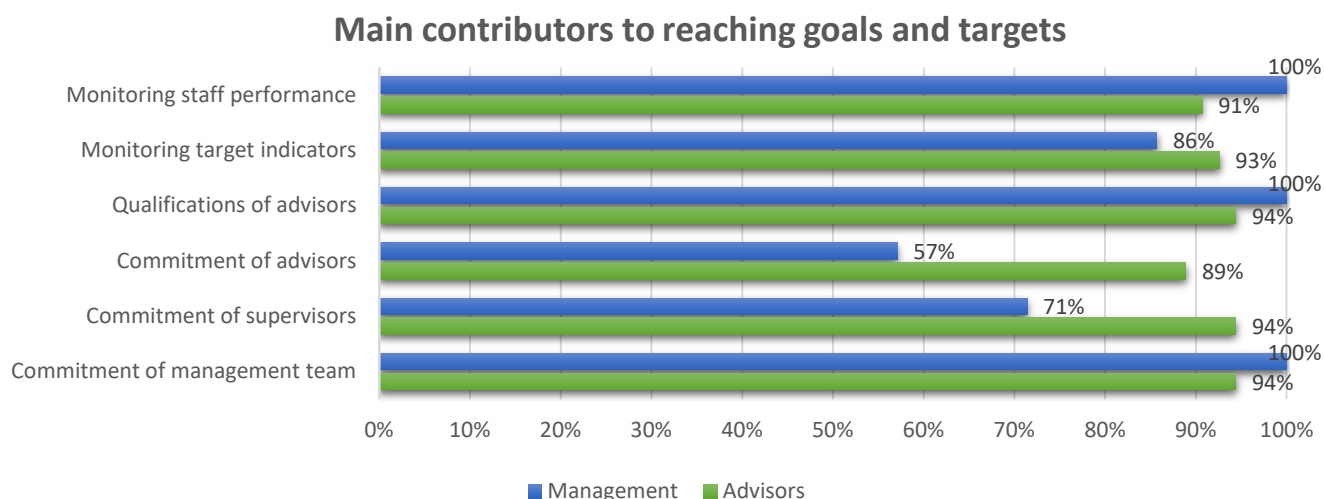


Figure 7: Target contributors

3.5 Organizational structure and organizational performance

3.5.1 Management roles and promotion of management performance

Advisors and managers assigned favourable ratings (above average, good or excellent) to aspects pertaining to the team dynamics within the Department. In particular, advisors and managers rated the provision of leadership in the Department highly, with all of the participating managers and 78% of advisors assigning ratings of either good or excellent to “Providing leadership”. This is in line with previous findings that leadership plays a key role especially in the efficient operational management of an organization (UNIDO, 2010). In addition to the high ratings for leadership, both advisors and managers also feel that there is cohesion and teambuilding at staff level (76% of advisors and 71% of management), as well as a positive organizational culture (78% of advisors and 86% of management) (Figure 8).

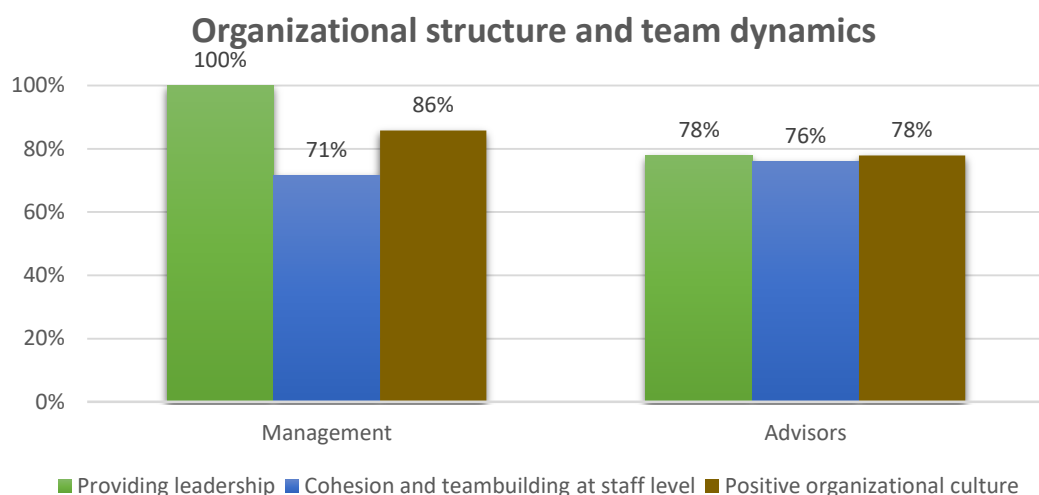


Figure 8: Team dynamics

In addition, a number of aspects pertaining to the organizational performance were rated favourably (above average, good or excellent) by both advisors and management. Advisors

(80%) and managers (100%) feel that the Department fares well in facilitating innovation of all kinds, including the use of modern ICT's, and has a positive impact both at farmer level (83% of advisors and 100% of managers) and on the economy (85% of advisors and 86% of managers). Furthermore, both groups gave positive ratings to both the management expertise and technical expertise of staff, with over three quarters of advisors and managers rating these aspects as above average, good or excellent. As already noted, the expertise of staff has been recognized previously as contributing greatly to the success of an organization (UNIDO, 2010). The highest ratings, however, were given for the reaching of set targets or indicators, with over 90% of advisors and all managers indicating that the performance of the Department is either above average, good or excellent in this regard (Figure 9). The high ratings given to the reaching of targets indicates both that targets are tracked and monitored, and that the Department is run in such a way that makes it possible for employees to reach their targets.

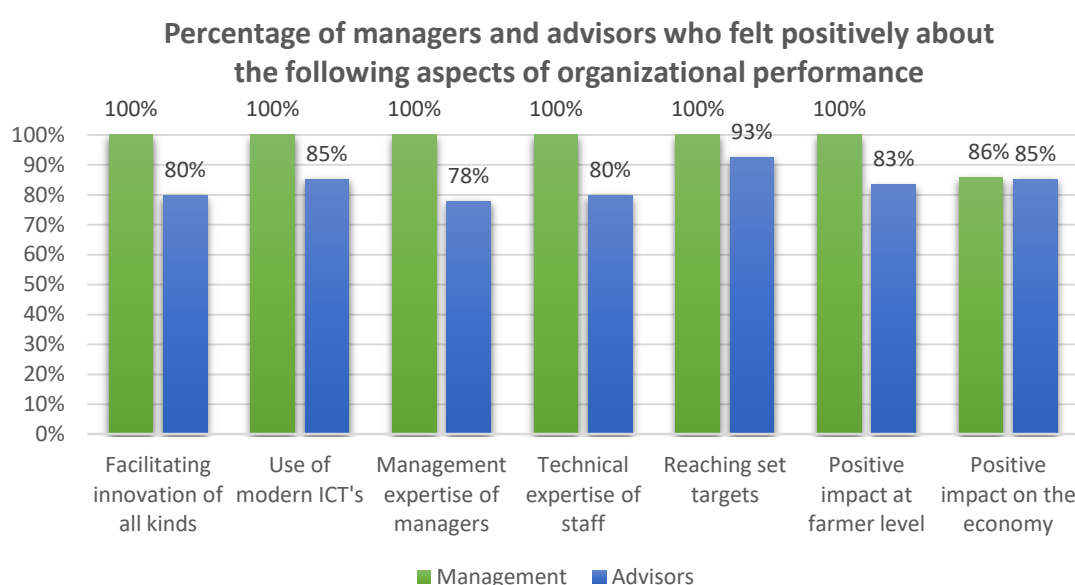


Figure 9: Organizational performance 1

3.5.2 Implementation and maintenance of norms and standards as a formalised code of conduct

The Department of Agriculture of the Western Cape has adopted the national norms and standards for extension workers, as developed and set out by the National Department of Agriculture, and approved by the Minister of Agriculture and Land Affairs, as a formalised code of conduct (National Department of Agriculture, 2005).

More than two thirds of advisors and all managers indicated that the Department's strict adherence to the national norms and standards has a moderate, high or very high impact on advisory services. The guiding principles of the norms and standards mostly applied in the Department according to the advisors are demand-driven extension that responds to farmer's expressed needs (72.2%), sound governance (72.2%), human and social capital development (72.2%), the participation of clients in the planning, decision-making, implementation and evaluation of their projects (72.2%), and the provision of relevant advice and technologies (70.4%).

Of the above guiding principles, two stood out for their perceived impact at farmer level especially from the view of the managers. These were the provision of relevant advice and technologies, and demand-driven extension and advisory services, with 71% and 57% of managers respectively rating each of these principles as impactful. These were also the two principles receiving the highest ratings for impact at farm level by advisors, although only 32% and 26% of advisors rated these principles as impactful.

3.6 Collaboration between the public and private sector

The collaboration with the private and public sector institutions pioneered by the Western Cape Department of Agriculture, entails strategic partnerships with commodity organisations, service providers and implementing agents, banks, insurance and other private companies in the province, as a means of providing inclusive services to farmers. Key to this approach is the creation of partnerships between government and the private sector at the institutional level to improve farming as an agro-business.

3.6.1 Collaboration with public and private partners

Out of a number of public and private partners that the Department collaborates with, the greatest number of advisors and managers rated the Commodity Project Allocation Committee (CPAC) (87% of advisors and 100% of managers) and the Departmental Project Allocation Committee (DPAC) (89% of advisors and 100% of managers) as important, very important, or absolutely essential to an increased impact of extension and advisory services at the farmer level. High ratings of importance to farm-level impact by both management and advisors were also given to both the Cape Agency for Sustainable Integrated Development in Rural Areas (CASIDRA), and its Unit for Technical Assistance (UTA), with over 70% of advisors and managers rating this agency as important to some extent (Figure 10).

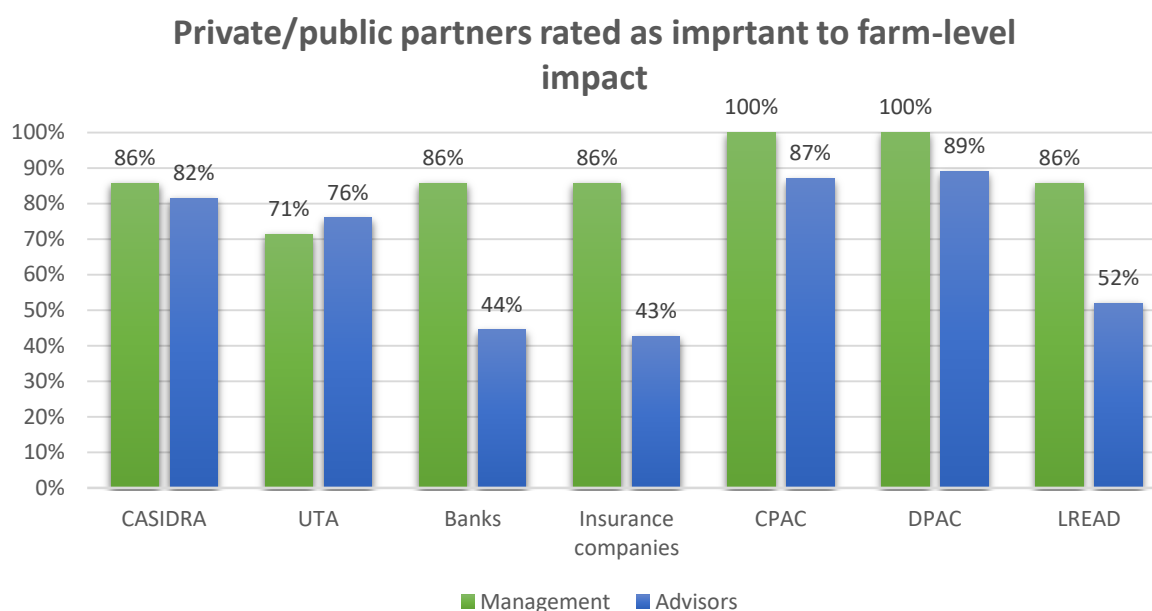


Figure 10: Private/Public partners

A deeper investigation into the clarity of goals, definition of roles and complementary services provided by the public and private partners shed some light on the above findings.

CASIDRA, UTA, CPAC, DPAC and the Commodity associations all received higher ratings in terms of clarity of goals, clear definition of roles between the Department and the partner, and complimentary services provided as a result of the collaboration, than LREAD, the commercial banks and the insurance companies.

3.6.2 Collaboration with commodity associations

Advisors and management were also asked which commodity partners collaborating with the Department are important contributors to increased impact of advisory services at farm level. Overall, the impact of the commodity partners was rated lower by advisors, but higher by managers, than that of the private and public partners. Only the fruit association, Hortgro, the Red Meat Producers Organization, and Grain SA, were rated as important, very important or absolutely essential to increased impact at farm level by more than two thirds of advisors. In stark contrast, all participating managers rated each of the commodity organizations as important, very important or absolutely essential to farm-level impact (Figure 11).

The collaboration with public and private partners, as well as commodity associations, can be seen as one of the key strengths of the Department, since positive engagement with stakeholders and excellent external communication is viewed as crucial to good management (UNIDO, 2010).

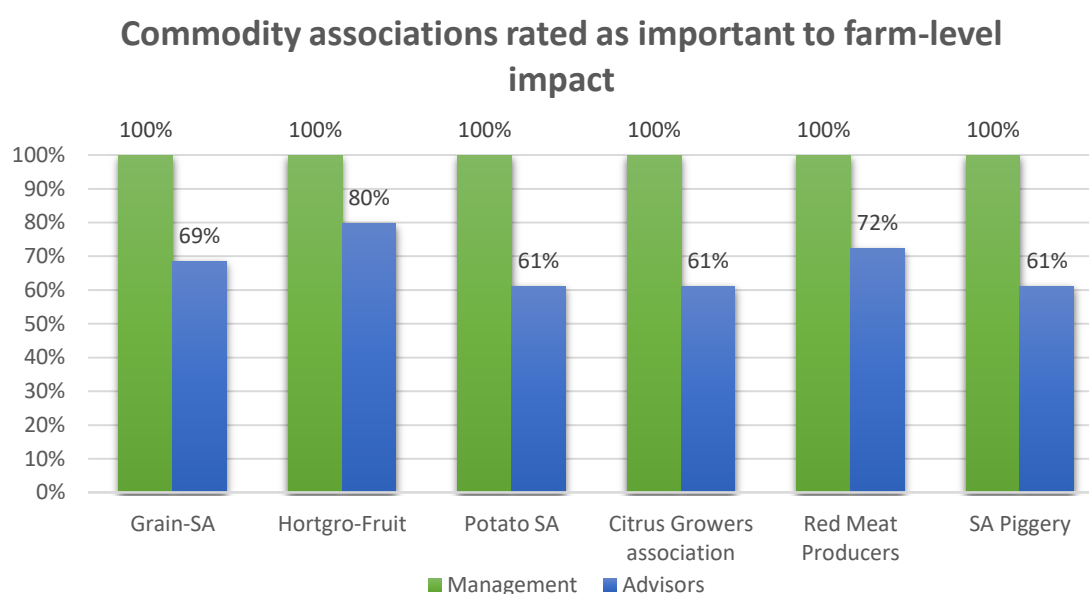


Figure 11: Commodity associations

3.7 Human resource management

3.7.1 Staff management

Nearly all advisors (92.6%) indicated that they are respectful to some extent towards management. Management's attitude towards employees received slightly lower ratings, albeit still largely positive, with three quarters of advisors indicating that management had a positive attitude towards employees. As noted in the introduction, it has been found that especially ethics and integrity foster staff respecting their superiors (UNIDO, 2010).

3.7.2 Employee incentives

There are a number of incentives awarded to agricultural advisors by the Western Cape's Department of Agriculture, including both intrinsic and extrinsic rewards.

The vast majority of advisors indicated that incentives given to agricultural advisors are to some extent based on their performance (87.0%), although only 18.5% said that the giving of incentives is entirely based on performance. It is therefore not surprising that over 80% of advisors indicated that performance appraisals are conducted once every six months or more frequently.

The impact of both types of incentives were measured on four dimensions of extension and advisory services, namely advisors' motivation for their work, the quality of the advice they give, the extent to which they reach their targets, and their efficiency and effectivity. The impact of all extrinsic incentives on advisor's motivation for their work were roughly equal, with between 56% and 67% of advisors indicating that each incentive plays an important, very important or absolutely essential role in motivating them. At the low-end of the range was office space (56%), whilst training possibilities received a high rating by the largest number of advisors (67%). Also receiving high ratings of importance for impact on motivation were means of transport and accessing information and knowledge through computers, mobile phones, etcetera, with 65% of advisors assigning ratings of important, very important or absolutely essential to each of these incentives.

For the remaining three dimensions, a common trend became apparent. The extrinsic incentive with the greatest impact on all three of quality of advice, reaching targets and advisor's efficiency and effectivity is accessing information and knowledge through ICT systems, with 69%, 67% and 76% of participants respectively indicating that this incentive is important to some extent to enhancing these dimensions of extension. Likewise, for all three these dimensions, office space and flexible working hours were given ratings of least importance. Both were rated as important to some extent to quality of advice given by only 37% of participants; to reaching targets by only 43% of participants and to advisors' efficiency and effectivity by only 46% of participants.

The intrinsic incentives rated as particularly important to advisors' motivation for their work were positive feedback from farmers, and improved livelihood of farm families, with 78% and 74% of advisors rating each of these incentives as important, very important or absolutely essential for their motivation. The lowest rating was given for positive feedback by management, although more than two thirds (67%) of advisors still rated this aspect as important to some extent to their motivation. Positive feedback by management also received the lowest rating of importance for both quality of advice given and advisors' efficiency and effectivity, with only a little over half of participants (54% and 57% respectively) rating this incentive as important to some extent to both these dimensions. Improved livelihood of farm families had the greatest impact not only on quality of advice given, but also on advisors' reaching of targets and their efficiency and effectivity, with 69%, 66% and 67% of advisors respectively rating this incentive as important to some extent to each of these dimensions (Figure 12).

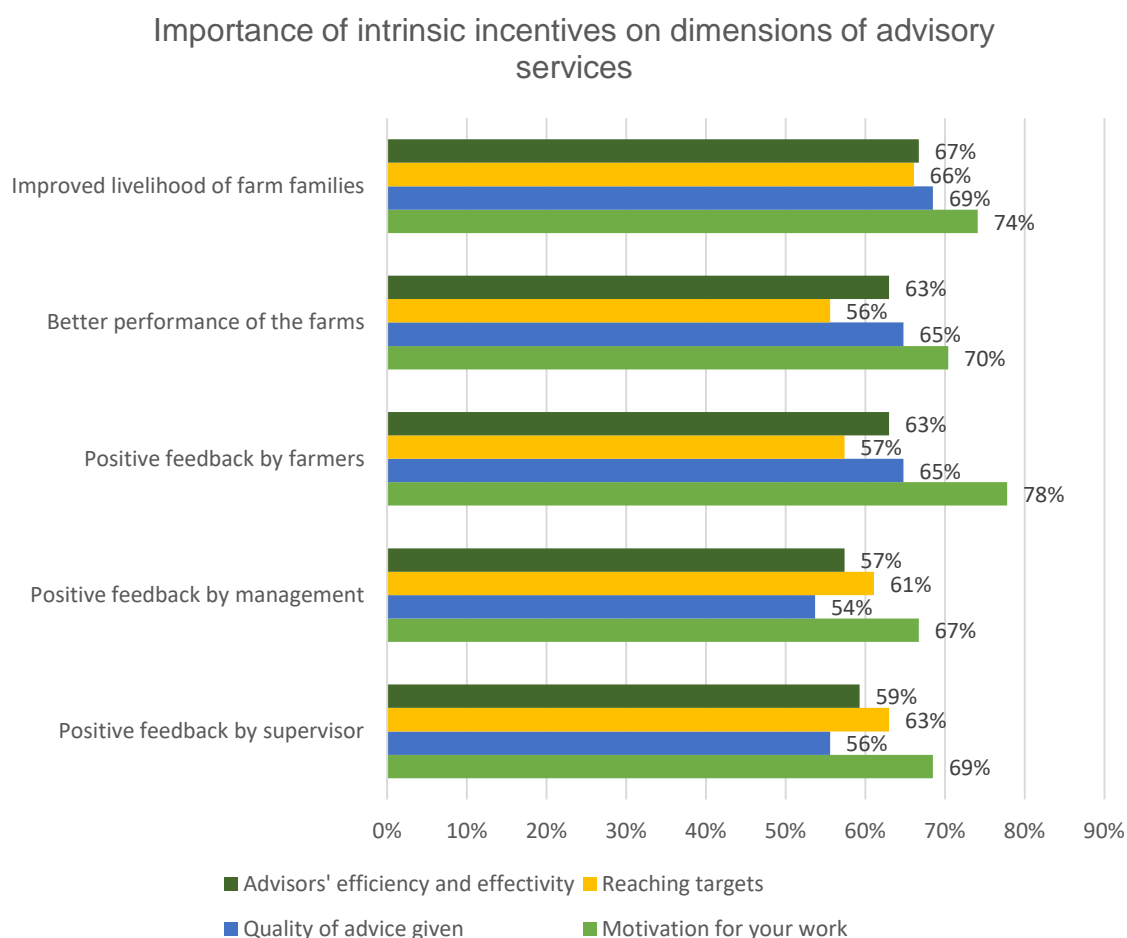


Figure 12: Intrinsic incentives

In addition to the above rewards and incentives, the Extension Recovery Plan (ERP) also provides rewards as incentives for agricultural advisors. The ERP rewards well performing advisors with study bursaries, rewards at the extension symposium, overseas trips and performance bonuses for innovative and extra work done during their normal extension work. Of these, both advisors and managers indicated that performance bonuses had the greatest impact on the advisors' motivation to fulfil their roles, with 76% of advisors and 86% of managers rating these bonuses as either important, very important or absolutely essential (Figure 13).

The positive impact of the incentives given to advisors on their motivation to fulfil their roles is in line with the assertion by Lipman (2013) and Bloom *et al.* (2012) that providing staff with incentives is one of the three core elements of good management practices.

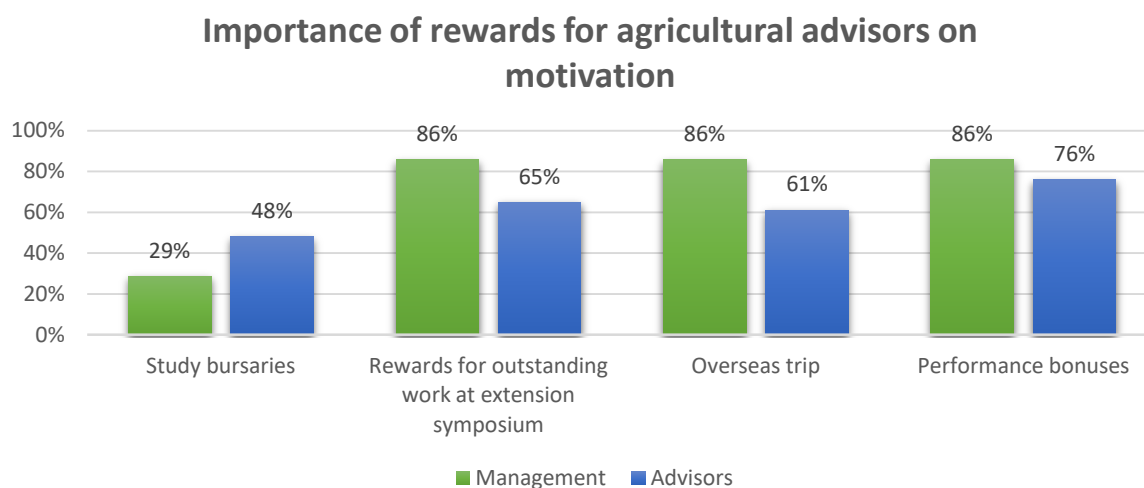


Figure 13: ERP rewards

3.7.3 Further education and training of extension staff and managers

The majority of managers (71.4%) and advisors (53.7%) indicated that they have been given the opportunity to further their studies through funding provided by the ERP and the Department. Both management and advisors feel that the opportunity to further their education have a positive impact on organizational performance, with 86% of managers and 72% of advisors indicating that the further education they received have a high or very high impact (Figure 14).

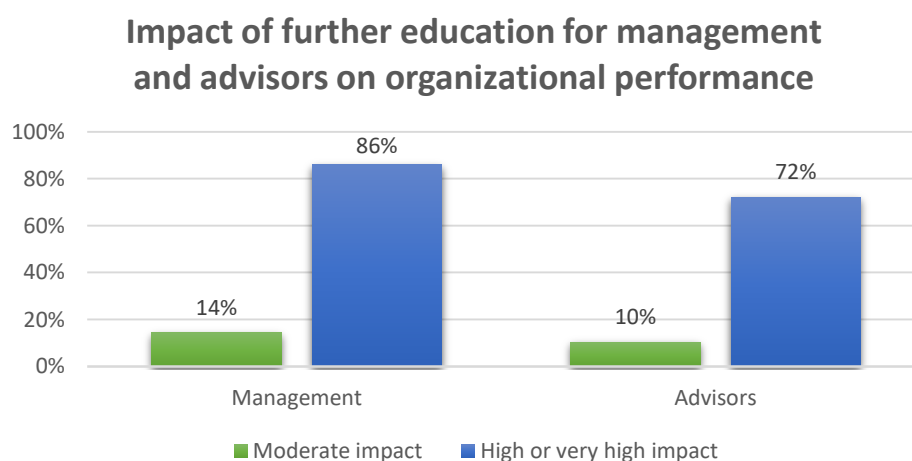


Figure 14: Impact of further education

3.7.4 Mentorship programme for advisors

In order to advance staff development, the Western Cape Department of Agriculture has a system in place where higher level agricultural advisors serve as mentors for advisors with less experience. Over 60% of advisors agreed to some extent that the mentorship programme resulted in them performing better, providing better quality advice, being more effective in giving advice, and knowing better their roles and tasks. That said, the mentorship programme seems to have less of an influence on advisors dealing better with administrative issues and

management, with only 46.3% of advisors agreeing to some extent that it helped them improve in each of these areas (Figure 15).

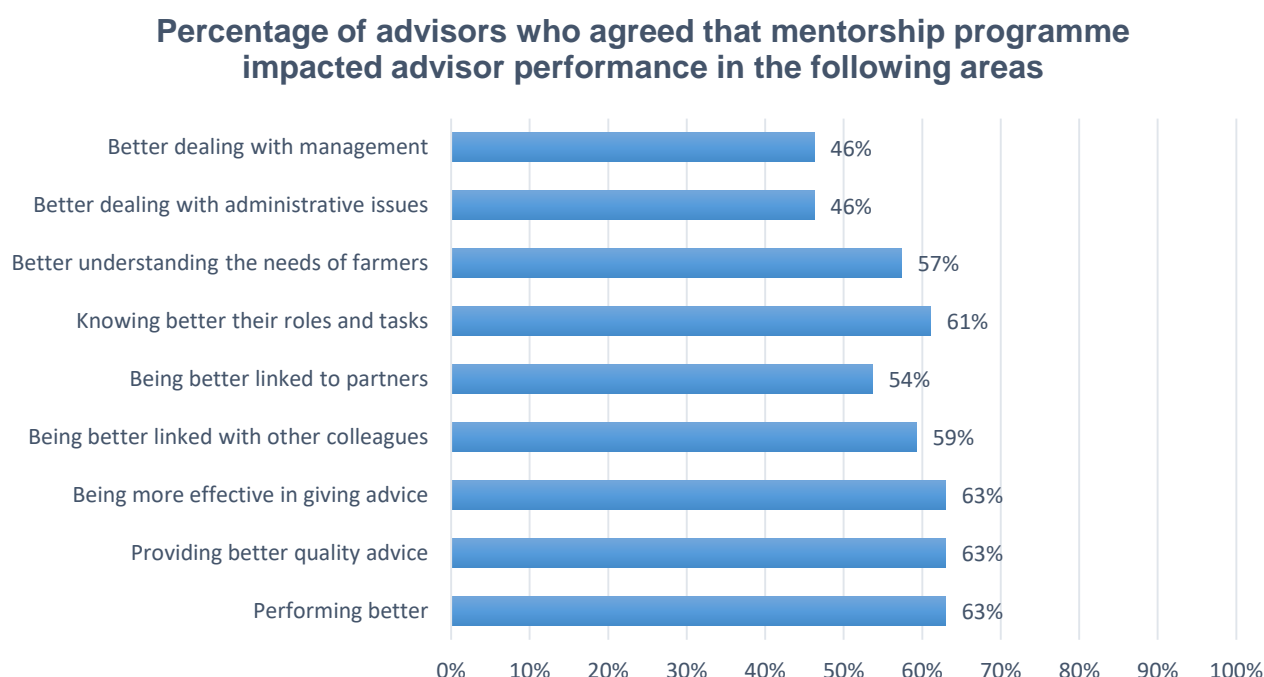


Figure 15: Impact of mentorship programme

3.8 Functional and geographical positioning of staff

Advisors were asked the extent to which people appointed at various levels play a role in the selection of a farm or project to become part of the extension programme. From the responses it became clear that there was a direct correlation between the level of appointment and the role played, with lower level appointments playing a greater role in the selection of farms or projects than individuals appointed in high level positions. Agricultural advisors play the greatest role, with 61.1% of participants indicating that people appointed as agricultural advisors play a role to a certain extent or to a large extent, whilst 59.3% said that senior agricultural advisors play a role to a certain extent or to a large extent (Figure 16).

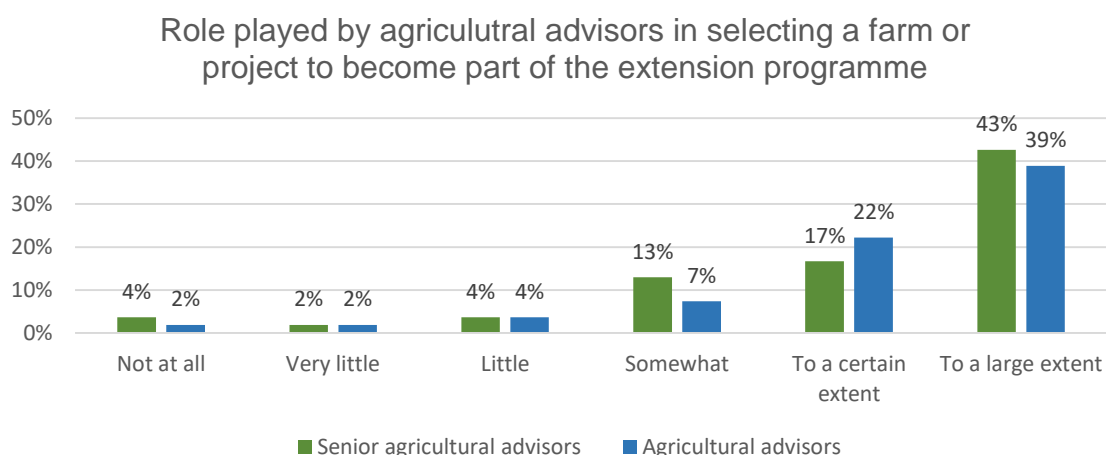


Figure 16: Role played by advisors in selecting a farm or project

It seems that private and public partners did not have much of a role to play in the selections of farms or projects to become part of the extension programme. The only organisations that were highlighted as playing some role by the advisors was CPAC and DPAC, although only a third of advisors indicated that these organizations played a role to a certain extent or to a large extent.

Once a farm has been selected, advisory services are mostly provided to farm managers and farm owners, with more than three quarters of advisors indicating that they target these individuals to a certain extent or to a great extent. Less emphasis is placed on giving advice to family members and to farm workers (Figure 17).

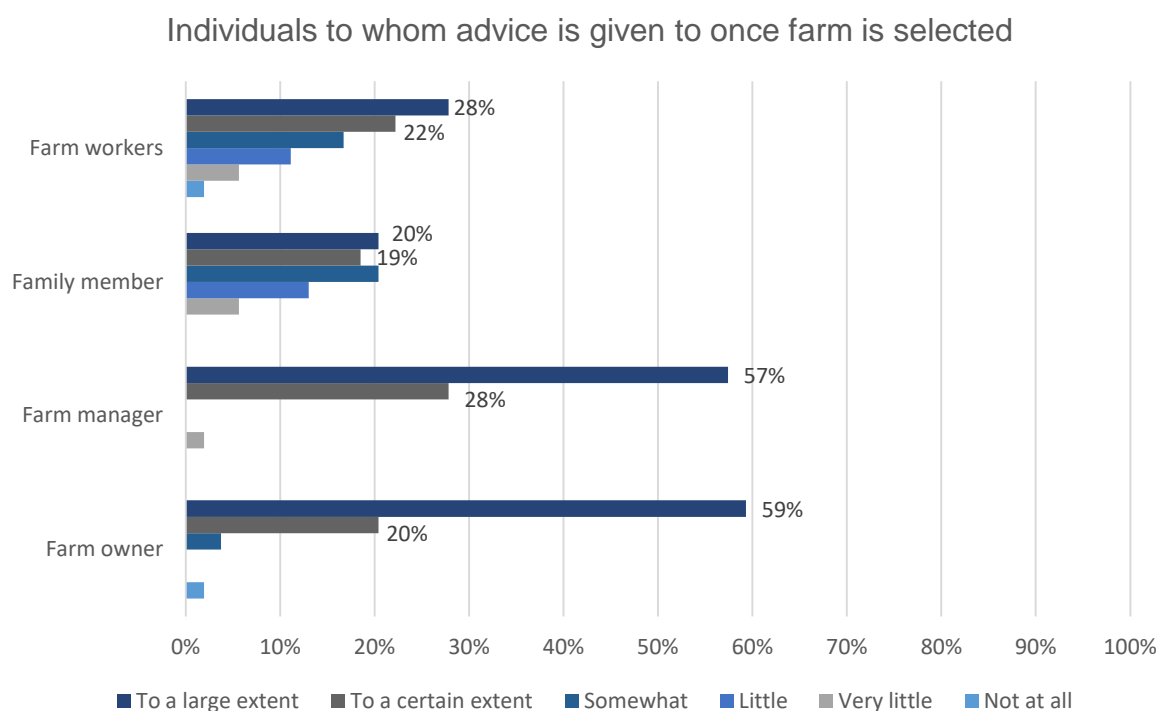


Figure 17: Individuals who advice is given to once a farm is selected

3.9 Access to knowledge and monitoring through information and communication technologies (ICT)

Multifunction Information and Communication Technology (ICT) systems have been implemented by management to allow ease of access of information for farmers and agricultural advisors, and to assist in monitoring the quantity and quality of extension services rendered to farmers. These systems include a number of ICT tools, such as the digital smart pen, cell phones, 3G modems, and laptops, as well as information accessibility systems such as the spatial intelligence project, Cape farm mapper and the Western Cape Agristats portal.

3.9.1 ICT tools

Twenty six advisors indicated that they were not using the smart pen when they started to work at the department. Of these, 25 (96.2%) indicated that they are using it now. For cell phones, only 8 advisors indicated that they did not utilize a cell phone when they started working at the Department, and all 8 indicated that they are using a cell phone now. The 3G modem is utilized by very few advisors, with only 11 indicating that they are using it currently. In contrast, the vast majority of advisors used a laptop both when they started working at the Department, and currently.

Advisors who indicated that they were not using the ICT systems when they started working at the Department, but are using it now, were asked to rate the impact of each of the systems on a number of dimensions of extension. When considered together, the ICT systems have the greatest impact on the supervision of, and control over, advisor's work, with an average of 74% (averaged over smart pen, cell phone and laptop) of advisors indicating that the systems have either a high or very high impact on increased control over their whereabouts, and an average of 76% indicating the systems have a high or very high impact on increased supervision of their work. The lowest average impact for the three ICT systems is on providing advisors with a better overview of work done and remaining to be done, with only half of advisors rating each device as either highly impactful or very highly impactful.

When considered individually, the smart pen also has a significant impact on more efficient reporting and more standardised reporting, with more than two thirds of advisors rating its impact in these areas as either high or very high. The smart pen outperformed both the laptop and the cell phone on both these domains, and is also the greatest contributor to the impact on increased control over advisor whereabouts. Apart from a few exceptions, the impact of the cell phone is generally lower than that of the smart pen and the laptop. That said, the cell phone has a higher impact than both the smart pen and the laptop on increased farm visits, with 63% of advisors indicating that it has either a high or very high impact on the frequency of farm visits, compared to 60% for the smart pen, and only 50% for the laptop. The laptop, however, outperformed both the smart pen and the cell phone on a number of domains, including its impact on better quality reporting, better work planning, better monitoring of achievement and targets, increased supervision of advisor's work, improved staff performance and better follow-up of the evolution of farm performance. For all these domains, more than two thirds of advisors indicated that the laptop has either a high or very high impact.

Advisors were also asked to indicate that extent to which they feel the reporting systems help their managers in a number of domains. The vast majority of advisors (93%) agreed to some

extent that the reporting systems help their managers to assess their work performance. In addition, more than two thirds of advisors agreed to some extent that the reporting systems help their managers to assess farm performance, make decisions on support needed by both staff and farms, make timely decisions and take action and adjust programmes based on the information gathered (Figure 18).

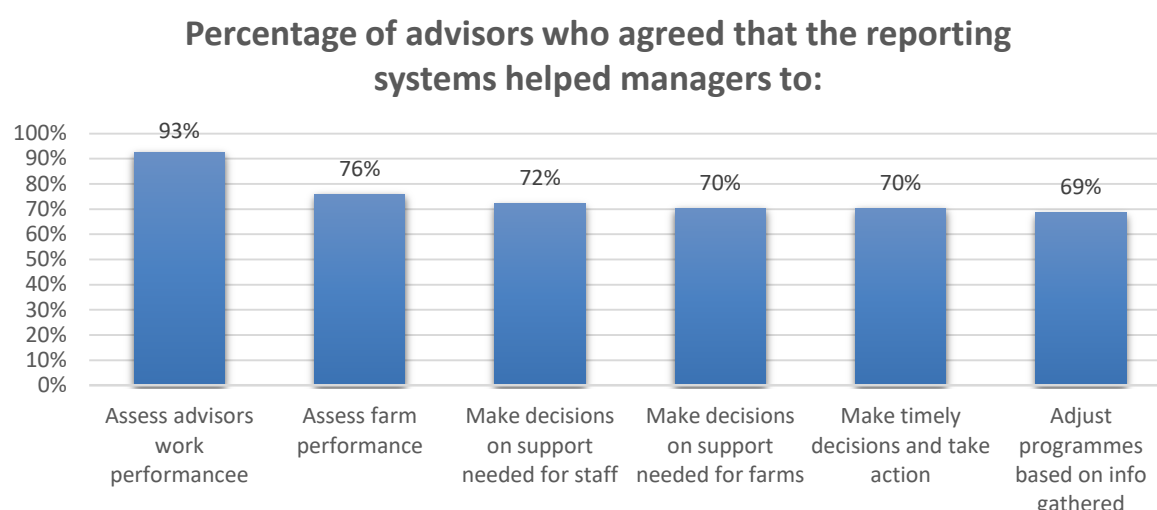


Figure 18: Impact of reporting systems on managers' performance

3.9.2 Information accessibility systems

The vast majority of advisors indicated that they have access to the Cape Farm Mapper (92.6%) and the Extension Suite Online (90.7%). Half of the advisors also have access to Fruitlook, whilst slightly more than a third or less have access to Western Cape AgriStats Portal, Cape agricultural mobile information system (CAMIS) and the Export certificate system (Figure 19).

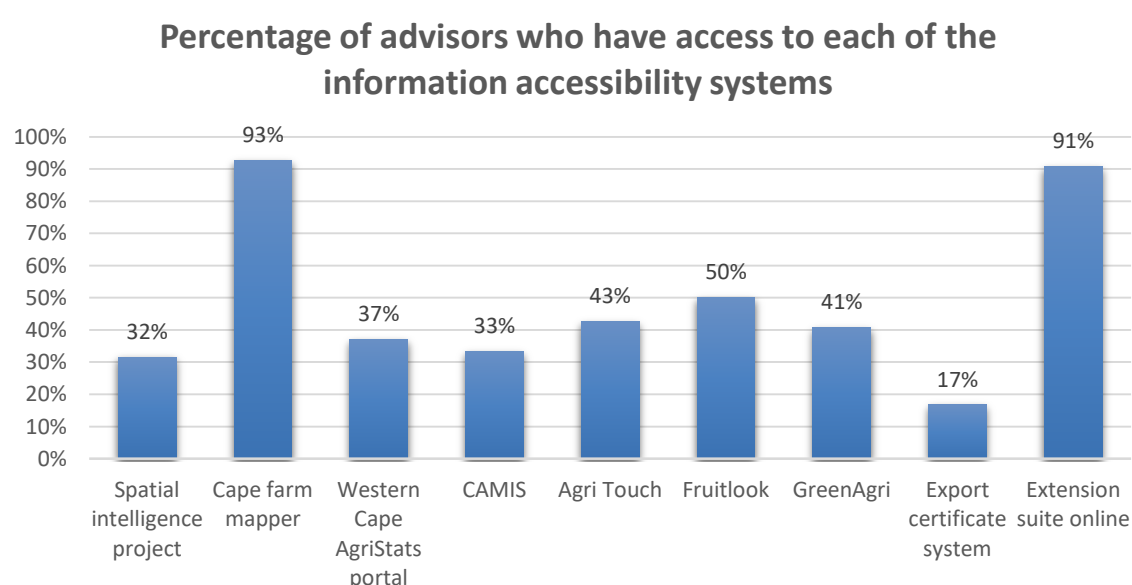


Figure 19: Information accessibility systems that advisors have access to

Advisors who have access to the information accessibility systems were also asked to rate the effectiveness of each of the systems on a number of indicators. When all indicators are considered together, the Spatial intelligence project and Cape farm mapper was given the highest ratings of effectivity by participants who have access to each, with 69% (averaged across all six indicators) and 72% of advisors respectively rating these information accessibility systems as effective to some extent. In contrast, Agri Touch and GreenAgri received the lowest average ratings of effectiveness (averaged across all six indicators), with Agri Touch rated as effective on average by only 34% of advisors, and GreenAgri rated as effective on average by only 30% of advisors.

When considered individually, the Cape farm mapper received the highest ratings for effectiveness as a source of knowledge for advisors and for accessibility, with 80% of advisors rating this system as effective to some extent on both these indicators. In addition, the Cape farm mapper was rated as the information accessibility system most often used (74% of advisors) and received the highest rating for user friendliness (74% of advisors). Of all the information accessibility systems, the Spatial Intelligence Project in turn was rated as effective to some extent by the greatest percentage of participants as a source of knowledge for farmers (71%) and a source of knowledge for management (71%). Apart from these two systems, the Extension Suite Online also received high ratings for accessibility and user friendliness, with more than two thirds of participants rating this system as effective to some extent in these areas. Finally, the Cape agricultural mobile information system (CAMIS) was rated as effective to some extent on all indicators by at least half of the participants.

3.9.3 Impact of ICT tools on dimensions of extension as viewed by advisors and management

As a means of getting an overall view of the influence of the various ICT systems on the dimensions of extension and advisory services, both managers and advisors were asked to complete a number of comprehensive tables summarising the ICT systems, and their impact on extension and advisory services.

Viewed overall, the laptop was seen as playing a particularly important role on the dimensions of extension by both advisors and management. In particular, it was given the highest rating of all ICT tools listed by both management and advisors for the relevance of advice and the effectivity of advisory services. The laptop was also rated highly by both advisors and management for its influence on the number of farms showing higher profits and the quality of advice given

Of particular importance, especially for the advisors, was the Smart Pen. It was rated as particularly influential for advisors on the number of projects supported, the number of farms visited, and the quality of advice given. It is noteworthy, however, that management rated the Smart Pen lower than advisors on all dimensions except quality of advice given. In contrast, the Cell Phone was seen as influential predominantly by management, who rated it as particularly impactful on the number of farms visited, the number of farms showing higher profits, the relevance of advice given, and the quality of advice given. That said, advisors assigned higher ratings than management to the cell phone for its impact on the effectiveness of advisory services, and the number of projects supported.

Finally, the 3G Modem was assigned lower ratings by both groups, but in particular by the advisors, who rated it as least impactful of all the tools on all the dimensions listed. That said,

more than half of management rated the 3G Modem as important impactful on the relevance and quality of advice given.

4. CONCLUSION

The current study provided some insight into the enabling factors and good management practices behind the success of extension and advisory services of the Department of Agriculture of the Western Cape Province. To start with, staff in the Department has an impressive combination of education and experience, with almost all managers and advisors educated to at least a bachelor's degree, and the majority having more than ten years advising experience.

The Department has a clearly defined mission and vision statement, which is greatly supported by both management and advisors. This contributes to clearly defined, realistic targets which are understood by those contributing it. The appropriate means for reaching set targets are also available, and thus it is not surprising that the majority of advisors have reached all their targets in 2015.

The Department has a good leadership structure which is regarded in a positive light by both advisors and management. Advisors have respect for their superiors, whilst managers in turn have a positive attitude towards advisors. The extension norms and standards defined by the national Department of Agriculture are strictly adhered to by all staff in the Western Cape's Department of Agriculture, with particular emphasis placed on the provision of relevant advice and technologies and demand driven extension and advisory service delivery.

The collaboration with private, public and commodity partners has a significant impact at the farmer level. Private and public partners viewed as playing a particularly important role in the success of extension and advisory services are CPAC, DPAC and CASIDRA; whereas Hortgro, the Red Meat Producers Organization and Grain SA are viewed as the most impactful commodity organizations who the Department is collaborating with.

The Department has a clear structure in place for the provision of employee incentives, which is mostly performance driven. These incentives are viewed as impactful on the successful delivery of extension and advisory services by both advisors and management, with performance bonuses playing a particularly important role in motivating advisors to perform their roles to the best of their abilities. In addition, the Department and the ERP providing funding for further education for both management and advisors is viewed as an important motivating factor which has a significant impact on organizational performance.

The final enabling factor playing a significant role in the success of the Department is the cutting-edge information and communication technology systems which have been introduced and are still being introduced. The ICT tools overall have a particularly important impact on management's supervision of, and control over, advisors' work. Viewed individually, the laptop seems to have the greatest impact on contributing to successful extension and advisory service delivery. Both advisors and management emphasised the importance of the laptop in the provision of advice that is both effective and relevant. That said, the Smart Pen played an especially important role for agricultural advisors, impacting the number of projects supported, the number of farms visited and the quality of advice given.

Although each contributes individually to the success of the Department, the synchrony of all the above factors results in the Western Cape's Department of Agriculture being at the forefront of the provision of extension and advisory services not only in South Africa, but in the developing world.

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CONTRIBUTION OF CATTLE CUSTOM FEEDING IN POVERTY ALLEVIATION IN COMMUNAL AREAS OF INTSIKA YETHU, CHRIS HANI DISTRICT.

Jaca M.,⁵² Ngambu, S.⁵³ & Noxakela, I.

Correspondence Author: M Jaca, Email: mfundojaca@gmail.com

1. BACKGROUND

The erratic rainfall and high incidence of droughts in the Eastern Cape makes a large majority of the population to depend on livestock production for their livelihoods (Musemwa, Mushunje, Chimonyo, Fraser, Mapiye, & Muchenje, 2008; Musemwa, Mushunje, Chimonyo, Mapiye, 2010). Cattle are the most important livestock species in most of the district municipalities in of the Eastern Cape Province, with Chris Hani district included, compared to other livestock species (Musemwa *et al.*, 2010). There is about 3.1 million beef cattle found in Eastern Cape Province over 65% comes from communal areas particularly Chris Hani (Eastern Cape Development Corporation, 2003).

Intsika Yethu is the municipality that is dominated by communal land, hence farmers are bound in communal livestock farming. In communal areas Majority of farmers in the oldest days keep livestock for status and less focus on business part (Coetzee, Montshwe, & Jooste, 2004). However; there has been a slight change where there is a continuous increase in number of farmers which have recently considered farming as a business. Their herd particularly cattle are criticised to be slow growers and hence take longer to reach slaughter weight (Berzborn, 2007; Delali, Dovie, Charlie, Shackleton, & Witkowski, 2006).

There are so many factors that are contributes in these cattle not to reach market weight at a right age. Among those is poor management of veld, genetic inferior, poor management of animal and lack of nutrition (Schoeman, 1989).

Conditioning of the finishing animals had become a priority to escape low income that could have made from the cattle when they only rely on the natural veld. Because there is already high number of animals which has been kept by the farmers which needs to be off-loaded from the natural pastures, custom feeding became the most possible technique to condition the herds (Nkhor, 2004). This is supported by the off-loading animals from the natural herd will also help improve the pastures through rest from grazing which will later encourage regrowth of the grass species (Bayer Alcock, & Gilles, 2004). Four custom feeding including Gxwalubombu custom feeding was formed with the joint venture of NAMC (main stakeholder), RDLR, local (IY) and district (CHD) municipality and DRDAR. Project started in April 2014 with 63 cattle but so far 245 cattle has been sold to different buyers

1.1 OBJECTIVES

- The objective of the establishment of the custom feeder is:

⁵² Department of Rural Development & Agrarian Reform, Chris Hani District, Private Bag X226, Tsomo, Eastern Cape, South Africa. Email: mfundojaca@gmail.com; Phone: 047 488 0038; Fax: 086 65071013.

⁵³ Department of Rural development & Agrarian Reform, Chris Hani District, Private Bag X112, Queenstown, Eastern Cape, South Africa. Email: smngambu@gmail.com; Ph.: 045 807 8000; Fax: 045 807 8057.

- To conditions animals for increased profitability.
- To reduce the excessive load in natural veld.
- To enhance large number of communal herds to participate and contribute in the local economy.

2. MATERIALS AND METHODS

2.1 STUDY SITE

The project is situated at in Tsomo, which is under Intsika Yethu Local Municipality. The custom feeding is located along R61 between Cofimvaba and Tsomo probably at 20km from Cofimvaba and 10km from Tsomo town. The site is approximately 640m above sea level. It is located 32.0104.73 S latitude and 27.4451.04 E longitudes. It is situated in the sour veld and has a vegetation ranging with *Themeda triandra*, *Panicum maximum*, *Digitaria eriantha*, *Eragrostis spp.*, *Cynodon dactylon*, and *Pennisetum clandestinum* being the dominant plant species.

2.2 PROJECT PROCEDURES

The project was carried out at Ngxwalubomvu custom feeding in Tsomo, Gxwalubomvu village. Animals at the custom feeding were monitored by the headman. On the day of arrival animals are weighed to determine the initial weight. They are also weighed again on the day of selling determine the final weight and be able to have the weight gain over the feeding period. The animals stay for a period of four months then sold to interested parties.

2.3 CUSTOM FEEDING OPERATIONS

The programme is operated by Gxwalubomvu farmers' co-operative which is looking after the overall activities of the daily feeding. Animals are sourced from various communities across the Chris Hani District and kept at zero grazing management where they are fed 10kg per head per day. Headsmen are responsible for feeding of cattle in the morning and afternoon and water available *ad libitum*. Each cattle takes 4 months at feeding then sold to interested parties including local buyers, auctions and abattoirs.

They are normally sold at various prices pending on the buyer, where local buyers pay more than the auctions and abattoir. An amount of R850 is deducted and contributes to the programme for each cattle fed and sold.

3. PRODUCTION TRENDS OVER TWO YEARS

Custom feeding program started on April 2014 with few cattle in the initial stages. There are so many factor that contributed to this. Some farmers were reluctant in availing the animals for feeding hence in their minds this is just one way of taking away their animals with no returns for them. In the first year, as shown in the table below, fewer cattle were availed and sold as they did not understand the purpose of the feeding program although it was presented to them. This could be attributed to lack of background information regarding the feeding program since farmers do not always attend in full numbers when service comes. The other reason was that when they sold their cattle through feeding program they have to contribute out R850 that is going to the scheme.

Following the consideration by the farmers that R850.00 is deducted after four months animals fed for free, there has been a change in number of cattle availed for feeding. Moreover; 2015 the number of cattle sold were higher compare to previous year. This could be due to improved knowledge of farmers regarding the custom feeding program since extension officers were encouraged to have sessions in their respective areas and wards presenting about the feeding program and its benefits.

The farmers which joined the feeding program earlier were able to sell the animals at any season across the year. Since they reside same areas with those still reluctant, others gain interest as they notice difference in neighbour animal body conditions which are fed in the feeding program. That alone contributed significantly in increasing number of animals recorded in the feeding centre.

Comparing the average price between the two years it does not change as it stays at R8500. Both years cattle are sold to Abattoir, Auctions and to local market the price is being negotiated between the buyer and seller, custom feeding only organize the buyers but does not influence the price. So far most of the cattle have been sold to the Abattoirs compare local market and auctions, the reason is that the local market is slow, it depends on the seasons where as in abattoirs meat is always a demand. When many cattle are sold to Abattoirs it means this custom feeding is also contributing to the economy of the province. Both 2014 and 2015 when you look at a total amount obtained to that of total feed cost , you find that there is positive impact the program does not run at a loss, it is something that can be sustained as shown in the table below:

Table 1: Production trends cost and out of the project over two year production period

Year	NS	AP	TAO	D.I	NB/FP (40kg)	P/B	TFC
2014	96	R8500	816 000	10kg	2880	R225.00	R648 000
2015	145	R8500	1 232 500	10kg	4350	R225.00	R978 750

NS- Number sold; AP- average price; TAO-total amount obtained; DI- daily intake; NB/FP- number bags/ feeding period, P/B-Price/bag; TFC- Total feed Cost;

4. CUSTOM FEED BENEFIT TO THE COMMUNITIES

Job creation: six workers- are employed in the centre by NAMC and local municipality, two are security and two are headsmen that are responsible for feeding, one clerk and manager. There has been improved cash flow in the area and community members which are also cattle owners are able to support their households. Livestock production particularly breeding has improved due to enough feed available in the natural veld attributed to continuous reduction of stock. It has become an eye opener to the communal farmers to realise farming as business. The custom feeding has extended the marketing season of the finished animals where farmers are able to sell at every season of the year.

5. CONCLUSION AND RECOMMENDATION

The have been increase income generated from the animals fed and sold in the centre due to the improved body condition scores of the finished animals. More farmers gain interest in the

feeding centre and less animals left in the natural veld which gives break and opportunity for regrowth in the grass species. With highest number of fed animals being sold in the commercial market, contribution of the communal stock to the economy can be confirmed.

Custom feeding had positive significant impact on market price and marketing season of the finished cattle which in turn improve living of the communal livestock owners. For this reason it is highly recommended that further initiative be established in other communal farmers who own large numbers of the cattle.

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LOCAL EGG PRODUCTION TO MEET THE DEMAND IN OUR COMMUNITIES.

Mngqibisa, P.⁵⁴ & Ngambu, S.⁵⁵

Correspondence Author: P Mngqibisa, Email: okuhle.oku@gmail.com

1. BACKGROUND

Chickens lay eggs in clutches. A **clutch** is a group of eggs laid by a hen on consecutive days (Ryan, Mickey, & Latour, 2010; Jacob, 2015). After laying a clutch, a hen has a rest period of about a day or more and then lays another clutch. A hen can lay only one egg in a day and will have some days when it does not lay an egg at all (Prabakaran, 1998). The reasons for this laying schedule relate to the hen reproductive system.

The body of the hen begins forming an egg shortly after the previous egg is laid, and it takes 26 hours for an egg to form fully. So a hen will lay later and later each day. Because a hen's reproductive system is sensitive to light exposure, eventually the hen will lay too late in a day for its body to begin forming a new egg (Nair & Ghadoliya, 2000). The hen will then skip a day or more before laying again. Also, hens in a flock do not all do not begin to lay on exactly the same day, nor do they continue laying for the same length of time. The length of time that a flock will produce eggs varies and egg size increases while shell quality decreases each year.

The number of eggs that can be produced by the flock of hens greatly affected by number of factors among those being breed, (Tariq, Sarfaraz, Zahid, & Azam, 2000), hen management prior laying, light management and nutrition (Van-Horne 1996; Mashishi, 2001). Commercial breeds of chickens have been developed specifically for egg production. The commercial White Leghorn is used in large egg production complexes, but these birds typically do not produce well in home flocks. White leghorn lays white-shelled eggs (Akyildiz, Konca, Ceylan, Ciftci, & Corduk, 1993). People purchasing eggs from small flocks often prefer to buy brown-shelled eggs, even though no nutritional differences exist between brown-shelled eggs and white-shelled eggs.

It is important to manage hens correctly, especially in the areas of nutrition and light management, because correct management will affect the level and quality of egg production (Farooq, Mian, Durrani, & Syed, 2002). Hens introduced in stage of laying must be managed the same way as previous owner, therefore previous management strategy has to be gathered as well. Layers of any type and age require a complete, balanced diet (Kristensen, Sillebak-Kristensen, 1996). Feed mills assemble the available ingredients in combinations that provide all the nutrients needed by a flock in one package. Nutrient deficiencies can adversely affect the level of egg production of hens.

⁵⁴ Department of Rural development & Agrarian Reform, Chris Hani District, Private Bag X131, Cradock, Eastern Cape, South Africa. Email: okuhle.oku@gmail.com; fax: 048 881 1238; Phone: 083 577 3723

⁵⁵ Department of Rural development & Agrarian Reform, Chris Hani District, Private Bag X112, Queenstown, Eastern Cape, South Africa. Email: smngambu@gmail.com; Fax: 045 807 8057; Phone: 045 807 8000

2. Project operation management

2.1 Project site

The project is situated in the commonage land along R61 between Cradock and Tarkastad at Inxuba yethemba local municipality. The area is dominated by the browse plants where *Acacia Karroo* dominates. The annual rainfall of the area is 400-500mm.

2.2 Project Layout

The project leases one hectare of well fenced land from the municipal commonage land. They keep two layer structures in the land. Each of the structures takes about 250 layers and therefore the project keeps 500 layers. The layers were introduced in the farm at the age of laying, the farm do not grow day old layers on their own. Hence the main objective of the project is the production of eggs.

2.3 Layer management

It is assumed that layers regulate their feed intake. These Layers are generally reared on full feed (FAO, 1997). The feed is offered to the birds using physical appliances such as hand use. The project does not have that electronically high standard equipment since its emerging. The birds are fed on feed containing 12 to 15% protein since they are no longer growing rather producing eggs. Given that these birds are introduced at the age where they are ready to lay eggs, in their diet the amino acids such as lysine, methionine are highly monitored assuring their presence in the diet. This also happens in the case of minerals such as calcium, and phosphorus. The main objective of special attention to the mentioned nutrients is basically supporting the maximum egg production (FAO, 1999; Mashishi, 2001).

These layers are provided with water at all time. This also goes same function to support maximum digestibility of the feed which affects egg laying. Chickens are called long-season breeders, meaning that they come into production as days become longer (Lai & Kan 2000). The layers are exposed to light for 11-12 hours instead of 14-16hours per day (Lai & Kan 2000). This is basically because the project does not have electricity in the farm. Light is important to stimulate and encourage significantly high egg production rate and less light hours in the current project could be the reasons why the chickens do not all lay per day in some days.

3. PROJECT VIABILITY

The project keeps 500 laying hens and they lay one egg per day each of them. There has been few instances where skipping of days in egg production has reported. Such cases were more dominating in winter particularly mid-winter than in summer. This however; affects the number of eggs produced per day and per week. It was also discovered that feed cost reduced I winter to an unknown level given that these hens consume little less amount of feed per day because of short day light. However; the reduced feed intakes had no distinct impact on amount of feed needed for a particular season. Moreover; the reduction in egg produced per day in winter has direct impact on income generated per week.

The eggs are produced and sold immediately within 10 days since the day of lay to avoid egg aging (Ryan *et al.*, 2010). This is supported with the evidence that eggs start forming and

aging in around 14th day of its life, Daghir, (1995); though number of factors such storage conditions come into play (Moorthy, Sundaresan, & Viswanathan 2000). Of those factors, the most contributing factor being temperature conditions (Moorthy *et al.*, 2000). The eggs are packed and sold in two forms- dozen and the 30^s and one egg is priced at R1 given that a dozen is sold at R12.00. Below are the production inputs and outputs incorporated from a summer season production at a price of dozen.

Table 1: Production inputs and outputs estimated in a summer season production

Hen No. & feed intake		Production inputs			Production output		
NL	WI(kg)	NB	Price/bag	TC/week	Eggs/week	Price/dozen	income/week
500	402.5	10 bags	R251.00	R2510.00	3500	R12.00	R3500.000

NL-number layer; WI-weekly intakes; NB-number bags; TC/W- total cost/week

4. MARKETING CHANNELS

The project produce in sold to varies parties around the production area. This starts from local buyers or consumers, shops and government entities. Below is the table showing parties buying eggs from the projects and estimated amounts of eggs per week

Table 2: Target market and estimated delivered per week

Consumers	Number of eggs	Price per dozen
Cradock old age home	300/week	R12.00
4 local shops	250 each/week	R12.00
Pay day (social grant)	-	R12.00
On farm sales	-	R12.00

5. THREATS AND OPPORTUNITIES

The project does not have permanent water source and in some cases they even have to carry water by buckets from their homes. This however; a serious threat because water has to be provided *ad libitum* to the hens for efficient utilisation of the consumed feed. Moreover; the water shortage might even affect daily production of eggs, body condition of the hens and result in wastage of feed thus increasing the production cost per egg. Infrastructure is also a

concern, farmers do not have transport for their produce to various selling points and that have high cost when they have to hire a vehicle.

The project is situated in an area which is closer (15km) to the research station. In that case the project members have access to production specialists to assist them in any stage of production. The project members normally attend educational trainings in the station.

6. RECOMMENDATIONS AND CONCLUSION

This project is able to make profit. Establishment of similar project in other communal areas is supported. There is a need for government and other relevant stakeholders to invest in the current project so that it can grow further and be able to procure their own required infrastructure. Project of this nature can be used for job creation.

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RURAL HOUSEHOLD FOOD INSECURITY LEVELS AND COPING STRATEGIES IN TWO VILLAGES OF NGCOBO, EASTERN CAPE, SOUTH AFRICA

Lingani, M.⁵⁶ Mushunje, A.⁵⁷

Correspondence Author: M Lingani, Email: MzwaneleL@elsenburg.com

ABSTRACT

This study investigates food insecurity in deep rural areas and determines what the rural household coping strategies to food insecurity are and aims to gain an in-depth understanding of household food access in the two selected rural areas of Ngcobo. For the measurement of the degree of household food (in)security, the Household Food Insecurity Access Score, abbreviated as (HFIAS) was used. Households were also asked to list their coping behaviors when anticipated with livelihood failure or food unavailability.

The majority (63.33%) of the interviewed households from Kwa-Gcina and 43.33% from Sixholosini villages were observed to be severely food insecure. A higher number of the households (78.33%) indicated high levels of uncertainties about their access to food. More than 70% of the households were not able to eat balanced meals and about 68% expressed worries of running out of food. The main cause of food insecurity was due to unemployment, an amount of government social grants that are not proportionate with inflation, unutilized open field land and home gardens. The results propose a situation where most households seemed to depend on grants for household food acquisition at the expense of farming as a livelihood strategy of alleviating food insecurity. During the times of food shortages, the majority household relied on borrowing food or money from friends and relatives.

Rural households should make all efforts by actively involving themselves with on-farm and off-farm activities and not rely only on social grants. The agricultural advisors should have quarterly meetings with communities and aspiring farmers and assist them with everything concerning farming, because each household in these two villages has a garden and they plant maize only, and input cost for maize enterprise is expensive if these households are not going to sell their produce. These households should be taught about planting a variety of vegetables such as potatoes, cabbages and tomatoes and buy other food items instead of vegetables.

Keywords: Food insecurity, coping strategies, HFIAS, Rural households

1. INTRODUCTION

1.1 Background

In South Africa there is enough food on the supply side to feed the population and there is also sufficient demand but many people especially in rural areas do not have access to quality food due to distribution and affordability (Tsegay, Rusare, & Mistry, 2014). Access to food is

⁵⁶ Western Cape Department of Agriculture, Muldersvlei Road Elsenburg 7607, Phone: 021 808 5317 Email: MzwaneleL@elsenburg.com.

⁵⁷ Department of Agricultural Economics and Extension, University of Fort Hare, Alice 5700, Phone: 040 602 2124 Email: AMushunje@ufh.ac.za.

the cost factor because not everyone can afford it. Increase in fuel prices, which leads to food prices escalating, is passed to consumers; in addition the average person on the street definitely feels that he needs more money. The old age grant in South Africa is the principal source of income for older persons who would, if not, be living in extreme poverty and these grants are estimated to have lessened the poverty gap for older persons by 94 percent (Sagner, 2000). Without such a security system, the aged people are exposed to become vulnerable to various shocks, risks and above all to poverty.

Van der Burg (2006) highlighted the fact that South Africa produces enough food to feed its population, but it experiences increasing rate of household food insecurity, even though the government provides social grants among South African people and these social grants are known to minimise the rate and effect of food insecurity. There are many definitions of food security, however the most used definition is by Food and Agriculture Organisation (FAO) which states that food security is “a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (Food and Agriculture Organisation, 1996). Food insecurity is still a big concern for many people in South Africa and this situation is also associated to high poverty levels that exist, especially in rural areas. More than half of poor South Africans live in rural areas and some of these people; despite being rural dwellers have no access to arable land (Perret, 2003). Even though South Africa is food secure at national level, many households are food insecure despite the 2010 State of the Nation Address promise to half poverty levels by 50% in 2015.

Food insecurity coping strategies are referred to as “fall-back mechanisms” concocted by people to deal with a short-term insufficiency of food (Mjonono, Ngidi, & Hendricks 2009). There are many factors that are contributing to food insecurity situation in South Africa, factors such as oil prices (paraffin, petrol and diesel), high unemployment rate and low income from those that are in the labour and the increasing electricity prices. For instance between the year 2013 and 2018, the electricity prices are expected to increase yearly by 8 percent (Ramayia, 2013). The costs of food insecurity are said to be high, since they affect all levels of social and economic life and at the household level, food insecurity leads to high health and medical costs, high funeral expenses and low labour productivity.

Villages or households that are vulnerable to food security adopt different strategies to lessen and cope with risk and shocks that affect them, based on the options offered by their internal resource endowment and their access to external assistance. Households depend on different strategies to cope with food shortage situation. These coping strategies are helpful for less food self-insufficient households to sustain their life rather than to make them food secure (World Food Programme, 2005). When rural households experience food shortages they borrow food from neighbours or exchange what they have in their gardens and fields for what they do not have. It is a key concern of this study to find out household food security levels in Kwa-Gcina and Sixholosini villages. It is also a concern of this study to find out the coping strategies that these rural households employ in order to mitigate food insecurity.

2. MATERIALS AND METHODS

2.1 Study area

Engcobo Municipality is a local municipality that can be categorised as a B4 meaning that it is largely rural with a low economic and revenue base. Ngcobo faces enormous challenges for development and is characterised by high accumulations for services, unemployment and

poverty (Local Government, Undated). The populace of Ngcobo is estimated to be around 149 000 people and 36 000 households. The majority of population is female (53%) and youth. It is estimated that Ngcobo has a GDP of R606 million and a purchasing power of approximately R1, 9 billion (Local Government, Undated). Regardless of this picture, unemployment remains as high as 57% with poor families estimated around 32% of population (Local Government, Undated).

The study was carried out in Kwa-Gcina and Sixholosini villages of the Eastern Cape Province. Kwa-Gcina and Sixholosini are situated Eastern part of Queenstown in the former homeland of Transkei. They are situated between the Xuka River and the Ngcobo Town; these villages comprise of a mix of communal and state lands. Both villages fall under the management of the Ngcobo local Municipality, based in Ngcobo. The Ngcobo local Municipality in turn falls within the jurisdiction of the Chris Hani District Municipality situated in Queenstown. Ngcobo is one of the poorest municipalities, with most of the areas being rural with 15 wards and 322 villages (Stats SA, 2011).

2.2 Sampling procedure

The study population consists of households in two rural villages of Ngcobo which is under Chris Hani District Municipality. There are 135 and 122 households from Sixholosini and Kwa-Gcina village respectively. A convenient sample of 60 households was randomly selected from the two villages. The person who is responsible for food preparation and meals was interviewed at his/her homestead. In the absence of this person, another adult who was present and ate in the household for the past 4 weeks was interviewed.

2.3 Data collection

From the collected data, the frequently used food security indicator was computed to assess the food security status of the households. For the measurement of the degree of household food insecurity, the Household Food Insecurity Access Score, abbreviated as (HFIAS) was used. The FANTA Household Food Insecurity Access Scale consists of asking respondents to answer nine questions which represent universal domains of the experience of insecure access to food (Deitchler, Ballard, Swindale & Coates 2010). Each interviewee was asked whether any of the nine questions was relating to their situation. If the answer was “Yes” to the situation, then they were asked the frequency of the occurrence (Rarely, Sometimes or Often) of that situation. The higher the score the more food insecure the household is. HFIAS Score ranges between 0-27 and this score was used to categorise households into four categories as shown in the Table 1 below.

Table 1: Catagorisation of food insecurity

QUESTION	RARELY	SOMETIMES	OFTEN
	1	2	3
1a			
2a			
3a			
4a			
5a			
6a			
7a			
8a			
9a			

Source: Coates, Swindale & Bilinsk, 2007

Food secure		Moderately food insecure	
Mildly food insecure		Severely food insecure	

Figure1: Food security classes

1 = Food Secure, 2=Mildly Food Insecure, 3=Moderately Food Insecure, 4=Severely Food Insecure. Households were categorised in the following manner;

HFIA Category 1 if [(Q1a=0 or Q1a=1) & Q2=0 and Q3=0 & Q4=0 and Q5=0 & Q6=0 & Q7=0 & Q8=0 & Q9=0]

HFIA Category 2 if [(Q1a=2 OR Q1a=3 OR Q2a=1 OR Q2a=2 OR Q2a=3 OR Q3a=1 OR Q4a=1) & Q5=0 & Q6=0 & Q7=0 & Q8=0 & Q9=0]

HFIA Category 3 if [(Q3a=2 OR Q3a=3 OR Q4a=2 OR Q4a=3 OR Q5a=1 OR Q5a=2 OR Q6a=1 OR Q6a=2) & Q7=0 & Q8=0 & Q9=0]

HFIA Category 4 if [Q5a=3 OR Q6a=3 OR Q7a=1 OR Q7a=2 OR Q7a=3 OR Q8a=1 OR Q8a=2 OR Q8a=3 OR Q9a=1 OR Q9a=2 OR Q9a=3].

A household that is food secure experiences none of the food insecurity (access) conditions, or just experiences worry, but rarely. A mildly food insecure (access) household worries about not having enough food “sometimes” or “often”, and/or is unable to eat preferred foods, and/or eats a more monotonous diet than desired and/or some foods considered undesirable, but only rarely. This household does not cut back on quantity or experience any of three most severe conditions going a whole day without eating, going to bed hungry or running out of food.

A moderately food insecure household sacrifices quality more frequently by eating a monotonous diet or less preferred food “sometimes” or “often”, and/or has started to cut back on quantity by reducing the size of meals or number of meals, “rarely” or “sometimes” but does not experience any of the three most severe conditions. A severely food insecure household has deteriorated to cutting back on meal size or number of meals “often”, and/or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating), even as infrequently as rarely

2.4 Data analysis

Data was analysed using the descriptive statistics with a view of understanding the distribution of the sample, and these were carried out by means of SPSS software and moonstats. Other descriptive statistics which include means, frequencies and standard deviations were calculated. Bivariate correlation was conducted on several variables using moonstatistics software program.

3. RESULTS AND DISCUSSION

3.1 Household Food security status

The results obtained indicate that, a high proportion of the households were experiencing food insecurity in the villages studied. The majority (63.33% from Kwa-Gcina and 43% from Sixholosini) of the sampled households were affected with severe forms of food insecurity. About (23.33%) of the more food secure households were located in Sixholosini. More than half 53.33% (63.33% from Kwa-Gcina and 43% from Sixholosini) of the sampled households from both villages were affected with severe forms of food insecurity and this is not in line with literature, because there are many households that are employed in Kwa-Gcina and it was expected that households in Kwa-Gcina to be food secure, but the results are opposite to what is expected. The reason for this could be the fact that about 3.3% of households in Sixholosini are involved with farming as compared to 0% from Kwa-Gcina, also with regards to social grants about 66.7% of households from Sixholosini has someone who gets old-age grant as compared to 40% from Kwa-Gcina. Additionally, with child support grant Sixholosini recorded 63.3 % and Kwa-Gcina scored 50% this shows that the social grants with farming lessens the food insecurity levels or it could be that those households with individuals that are working are earning less income than the other village and household sizes could also be the cause for food insecurity.

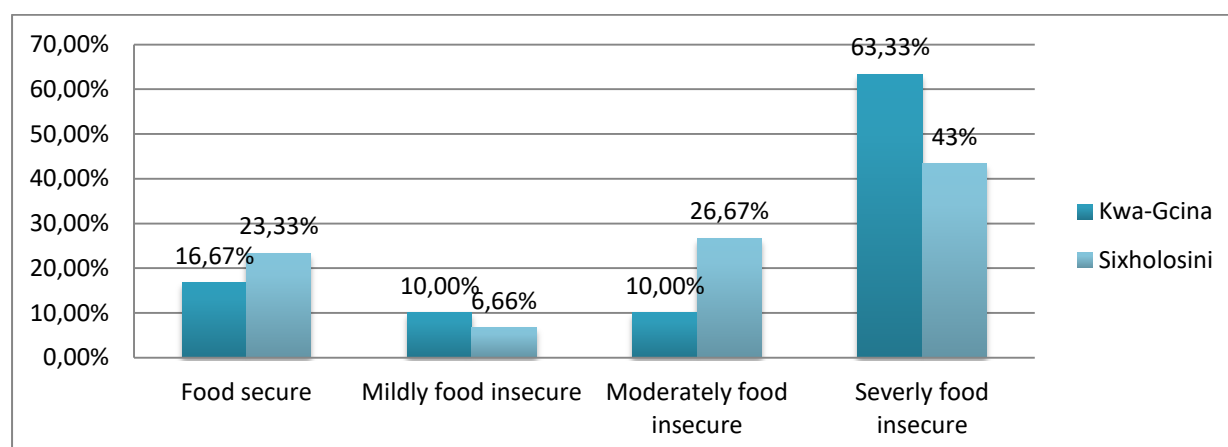


Figure 2: Percentage distribution of Household Food Security level

Source: Field survey, 2013

Twenty three percent of the more food secure households were located in Sixholosini and 16.66% were from Kwa-Gcina village. Severe food insecure was more prevalent in Kwa-Gcina with a total percentage of 63.33% and 43.33% were from Sixholosini village (Figure 2). The results show that 8.33% (10% and 6.66% from Kwa-Gcina and Sixholosini respectively) of households from both villages are in mildly food insecure category and 18.33% (10% and 26.67% from Kwa-Gcina and Sixholosini respectively) are moderate food insecure.

The majority of the sampled households (78.33%) encountered problems of sleeping at night hungry or spending the whole day without eating anything because there was not enough food as shown in Table 2. Few households (21.67%) often did not encounter any problem of spending a whole day and night without eating. The majority of the households interviewed had their members sometimes not able to eat the kinds of food they preferred because of lack of resources.

Table 2: Percentage distribution of Households responses to HFIAS questions

Food access statement	Response (%)
Q1. Worried that food would run out	78.33%
Q2. Unable to eat balanced meal	74.99%
Q3. Worried that the household would not have enough food	68.34%
Q4. Ate non-preferred food	66.67%
Q5. Reduced size of meals	71.67%
Q6. Skipped some meals in a day	65%
Q7. No food at all in the household	60%
Q8. Went to sleep hungry	44.99%
Q9. Did not eat for the whole day	46.67%

Source: Field survey, 2013

Table 2 presents results from the household responses to the Household Food Insecurity Access Scale questions. A higher number of the households (78.33%) indicated high levels of uncertainties by about their access to food. More than 70% of the households were not able to eat balanced meals and about 68% expressed worries of running out of food. From both villages households reported the severe forms of food access problems such as having no food at all in the household (60%) and having no way of accessing food at least once, some members going to bed hungry (44.99%) and also some household members not eating for a whole day (46.67%). This means that both villages are struggling to secure food.

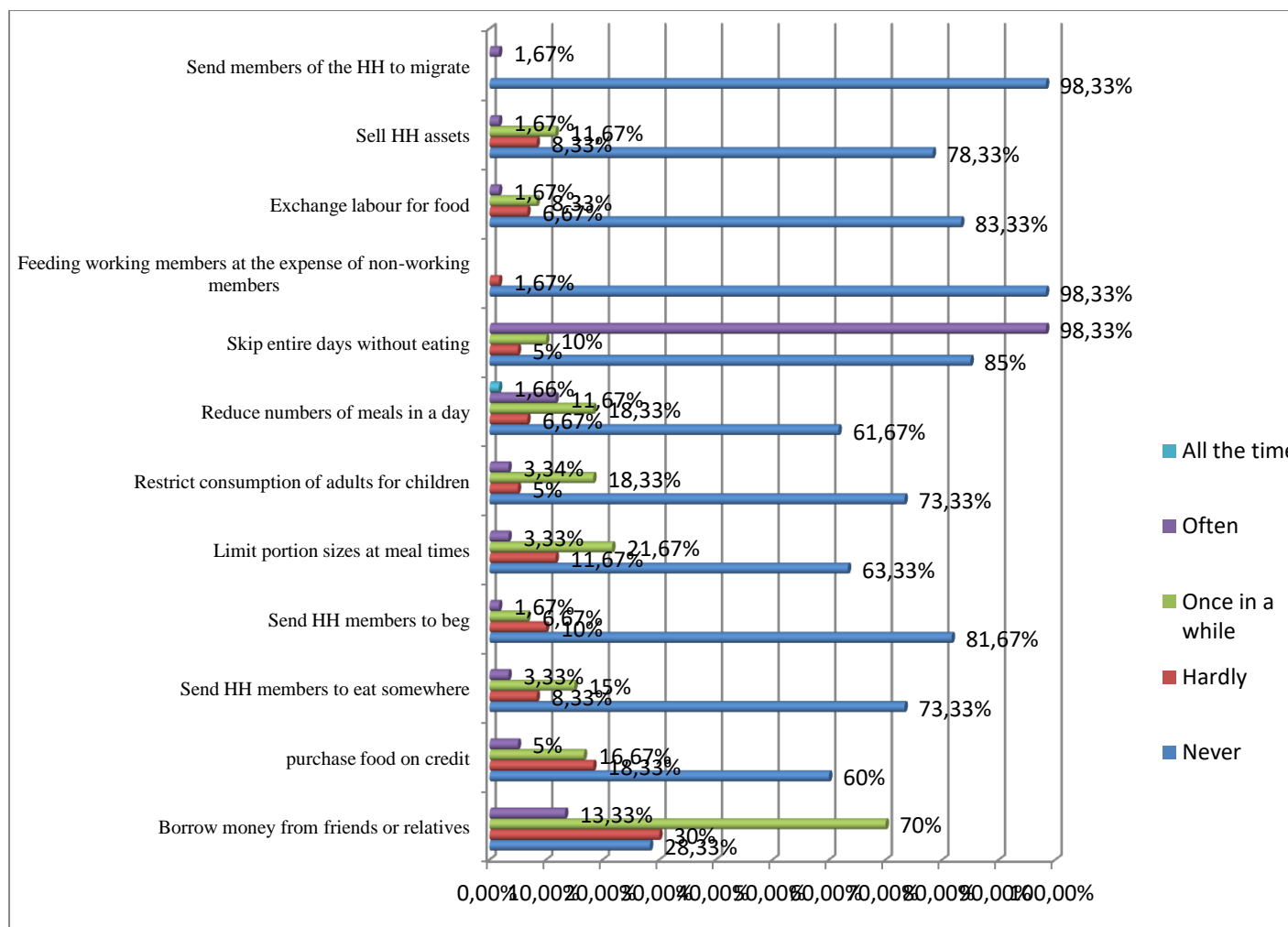


Figure 3: Distribution of household consumption coping strategies

Source: Field survey, 2013

The mainly used consumption coping strategies to household food insecurity amongst the interviewed households in Kwa-Gcina and Sixholosini were (sending household members to migrate with 98.33% of the interviewees using this strategy. This coping strategy was the frequently used amongst all food insecure households. Borrowing food from shops and money for purchasing food from friends and relatives, and looking for petty jobs were therefore the most common used strategies (Figure 3). Formal credit institutions required assets as collateral hence due to lack of assets that can be used as collateral, sixty percent of poor and marginal households rely on informal credit sources with high interest rate and this may be a coping strategy but have a negative effect in future to the extent of threatening future food security status.

Table 3 summarises the correlation between food security and coping strategies. In Table 3 the strength of the relationship between food security and coping strategies is presented.

Table 3: Relationship between food security and coping strategies

Food security	α (alpha)	Pearson-product moment	p-value
Coping strategies	0.05	0.29	0.027

Source: Field survey, 2013

Using Moonstats the correlation between food securities and coping strategies the following values were obtained.

$$r(x, y) = 0.29$$

$$n = 60$$

$$p = 0.027$$

In this case the value of r is 0.29 which can be considered a moderate correlation. The p -value is 0.027 which means that the correlation is statistically significant. Therefore Food security and Coping strategies are statistically significant at 5% level. This means that there is a relationship between food security and coping strategies, this is due to the fact that the more coping strategies a household employs the more food insecure that household will be. If the value of p is less than α (5% or 0.05) the relationship is statistically significant.

From both villages households reported the severe forms of food access problems such as having no food at all in the household (60%) and having no way of accessing food at least once, some members going to bed hungry (44.99%) and also some household members not eating for a whole day (46.67%). The mainly used consumption coping strategy to household food insecurity amongst the interviewed households in Kwa-Gcina and Sixholosini was sending household members to migrate with 98.33% of the interviewees using this strategy.

4. CONCLUSION AND RECOMMENDATIONS

In trying to reduce the effects of not having enough food to meet their home's needs, the majority of the households employ coping mechanisms or strategies that have harmful effects. For example borrowing of money by a struggling household result in fights among households if the borrower does not pay back the money or in case of loan sharks, the struggling household pays the money with huge interest normally ranging between 30-50 percent. The majority of the people in the study areas were not practising farming and that is not expected in rural areas where there is enough land to farm. The reason for not farming was the fact that the input cost such as fertilizer, labour and hiring a tractor are very expensive and from the study it is unambiguous that most of these households depend on social grants which is not enough for family consumption and at the same time to be used as farming production expenses.

In most rural areas in developing countries households are the producers of food hence there is a need to make rural households in South Africa aware of the importance of subsistence farming as a way of enhancing household food security as it was some decades ago. A high unemployment level in the area studied was the main reason behind the fact that the majority of the households sorely depend on government social grants as their livelihood strategy. This is not sustainable since it is problematic for the government to increase the amount of these grants at the rate of inflation as government sources of revenues are scarce (high unemployment). The incapability of government to increase the amount of these social grants has severely reduced the purchasing power of social grants and hence food insecurity is increased among households who mainly depend on social grants.

Rural households should make all efforts by actively involving themselves with on-farm and off-farm activities and not rely only on social grants. The agricultural extension officers should assist rural households of these areas with farming methods and move away from producing maize only, these communities should try vegetables and be assisted on how each of these vegetables are produced and which chemicals to use and the department should

provide them with free inputs such as planting material, chemicals and fertilisers. Private sectors should invest in rural areas because there is enough space and all the resources like water and energy are available to create jobs for rural people and the government should build roads because it is difficult to distribute food in most rural areas hence the transport cost is very high. The government should review the social grant system as it does not take into account rising food costs.

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WHO FEARS WHAT AND HOW MUCH? AN INVESTIGATION OF KAROO FARMERS' RISK PERCEPTIONS IN 2012.

Conradie, B. I.⁵⁸

ABSTRACT:

It is a mistake to treat farmers' attitudes as homogenous. This study used principle component and cluster analysis to show that not all farmers perceive the same factors to threaten their businesses' survival to the same degree. The variance in attitudes as captured by twenty Likert scale items reduced to six broad explanatory themes, namely the regulatory environment, the price environment, the rule of law, climate change, predation and labour availability. Clustering on these components, three homogenous groups were identified. The first cluster of 18 farms had particular concerns about labour availability. The second cluster of 19 farms seemed to worry about many things while the third cluster of 15 farmers was the least concerned of the three groups and seemed unconcerned about most things. Due to limited sample size it was hard to explain the reasons for these differences. However, there were at least marginally significant differences in profitability, flock size, the impact of a recent drought as well as two proxies for farming skills across clusters. Negative attitudes were associated with lower profitability and being more affected by the recent drought, although it is recognised that the seriousness of a drought is determined as least as much by stocking density decisions as it is about a lack of rainfall. Concerns about labour availability were associated with operating larger farms. Good extension always starts with risk perceptions and we must never assume that attitudes are homogenous even in homogenous communities.

KEYWORDS: risk perceptions, k-means clustering, principle component analysis

1. INTRODUCTION

The Karoo is now one of the most vulnerable parts of South African agriculture, because its technical progress is limited by climate. Archer (2000) argued that early attempts at intensification was the system's downfall, a claim for which Hoffman's (2014) longitudinal studies of vegetation cover and carrying capacity in Namaqualand provides some support. As a result we measure virtually zero technical progress in the Karoo over the second half of the twentieth century, while the rest of South Africa agriculture grew reasonably well over that period (Conradie, Piesse & Thirtle, 2009; Thirtle, Sartorius von Bach & van Zyl, 1993). Overgrazing is one thing, but the region is also vulnerable to climate change which is predicted to become hotter and drier with rainfall predicted to become more erratic (Archer, Oettlé, Louw, & Tadross, 2008; Blignaut, Ueckermann, & Aronson, 2009). This is bad news for family farms which already use few inputs besides land and labour and now are neither efficient nor profitable (Conradie & Piesse, 2015; Conradie & Landman, 2015). However, Karoo farmers report that their financial difficulties are insignificant compared to the threat posed by predators, which have been estimated to cost the industry as much as 30% per year (Van Niekerk, 2010).

⁵⁸ School of Economics, University of Cape Town, Private Bag X1, Rhodes Gift, Cape Town, South Africa. Phone: 021 650 4774, Fax 021 650 4657. Email: beatrice.conradie@uct.ac.za.

No empirical study has been done to date to investigate how these farmers rank and classify the various difficulties that they are faced with, or what explains their risk perceptions. The main contribution of this paper is that it lays the groundwork for studying the role of risk perceptions in explaining the adoption of the best management practices recommended for sheep farmers.

2. DATA AND METHODS

The data used in this analysis come from the farm management survey of an interdisciplinary study of the impact of predators on livestock farming in the Laingsburg district of the Central Karoo of South Africa. This dataset was previously used to investigate the system's profitability and efficiency as well as the correlation between productivity and the farmer's preferred information sources (Conradie & Landman, 2015; Conradie & Piesse, 2015; Conradie, forthcoming). Wave 1 of four, on the 2012 season, approached 66 farmers of whom 60 agreed to be interviewed (91%) and 58 (88%) gave useable responses to most questions. The 37,000 sheep and goats on which this group reported, amounted to 78% of the small stock recorded for this district in the 2002 farm census (Statistics South Africa, 2006).

The average farmer in the sample reported that he or she runs 620 breeding ewes on 7,374 hectares of Nama-Karoo or Succulent Karoo rangeland. In 2012 the average farm contributed 77% of household income. The average farmer was 53.9 years old and the most frequently reported type of education was a two-year agricultural diploma. As is often the case in South African agriculture, most farmers were married with children. Although community (and family) networks seemed quite strong in this community, few forms of social capital other than membership of the Dutch reformed church were encountered.

Wave 1 included a set of twenty questions which asked respondents to rate on a five point Likert scale a list of potential threats to the survival of their businesses. The word labels used for the five categories were 1 = no threat, 2 = slight threat, 3 = threat, 4 = serious threat and 5 = severe threat. The twenty items touched on various aspects of regulation (labour laws in general, environmental laws in general, statutory minimum wage regulations, the extension of the security of tenure act and land reform), as well as the labour market (availability of trustworthy labour, unemployment), crime (stock theft, farm attacks), environmental issues (predators, drought, climate change), the financial context (high input prices, low community prices, price risk, exchange rate risk) and support to the sector (competency of the local cooperative, market access for farmers and the availability of drought relief assistance). Only 52 people responded to all twenty items.

The empirical analysis, which consisted of principal component analysis and cluster analysis, was conducted Stata 13.0. The purpose of the principal component analysis was to reduce the set of twenty factors to a more manageable set of underlying components to risks. The technique does this by forming linear combinations of the various factors so that the maximum amount of variation is explained by the minimum number of components. The command "factor" with the options "pcf" and "mineigen (1)" extracted six principal component factors with Eigen values of ≥ 1 . Then the command "rotate" applied orthogonal (Kaiser's varimax) rotation to make the factor loadings easier to interpret. Factors which loaded at values of greater than ~ 0.4 were included in the six component indices that represented risk perceptions. The cluster option "k-means" used Euclidian distance as a measure of dissimilarity to partition the sample into $k=3$ homogenous clusters. Since cluster membership was sensitive to the variable order in the "cluster" command, the variables were

placed according to their Eigen values as reported in Table 1. Cross-cluster differences were explored with single variable analysis of variance (ANOVA) tests as a first attempt at explaining the formation of risk perceptions.

3. RESULTS AND DISCUSSION

The mean response on the Likert scale was 3.16 ± 1.44 out of a possible five for the list of twenty potential sources of risk that farmers were presented with. This means that the list generally included factors that farmers recognised as threats to the survival of their businesses. Moreover, a mode response of 5 indicated that most people thought that most of the threats listed could severely harm their operations, which implied that these risk perceptions probably seriously affects how farms are run and investment decisions are come to. It makes this topic important for extension staff that hope to influence farmer behaviour.

The general area of predator management was identified as the most serious threat with item scores of 4.29 ± 0.907 on predator problems and 4.03 ± 1.20 on predator control regulations, which was no surprise given reports of the intensity of the ensuing human-wildlife conflict (Nattrass & Conradie, 2015) and the magnitude of the damage inflicted on sheep farming operations (Van Niekerk, 2010). In contrast, farmers were unanimously least concerned about the possibility of poor service by the local cooperative which was scored of 1.64 ± 0.97 out of a possible five as well as a lack of market access which scored 2.02 ± 1.13 . See Figure 1 for the rankings of the other seventeen Likert items. In a subsequent open-ended question a new variable, namely fracking for shale gas exploration, replaced predation as the group's most serious concern. In this question, predation was listed as the third most important issue after shale gas exploration and a group of factors that referred to climate including drought, climate change and various descriptions of weather "weirding".

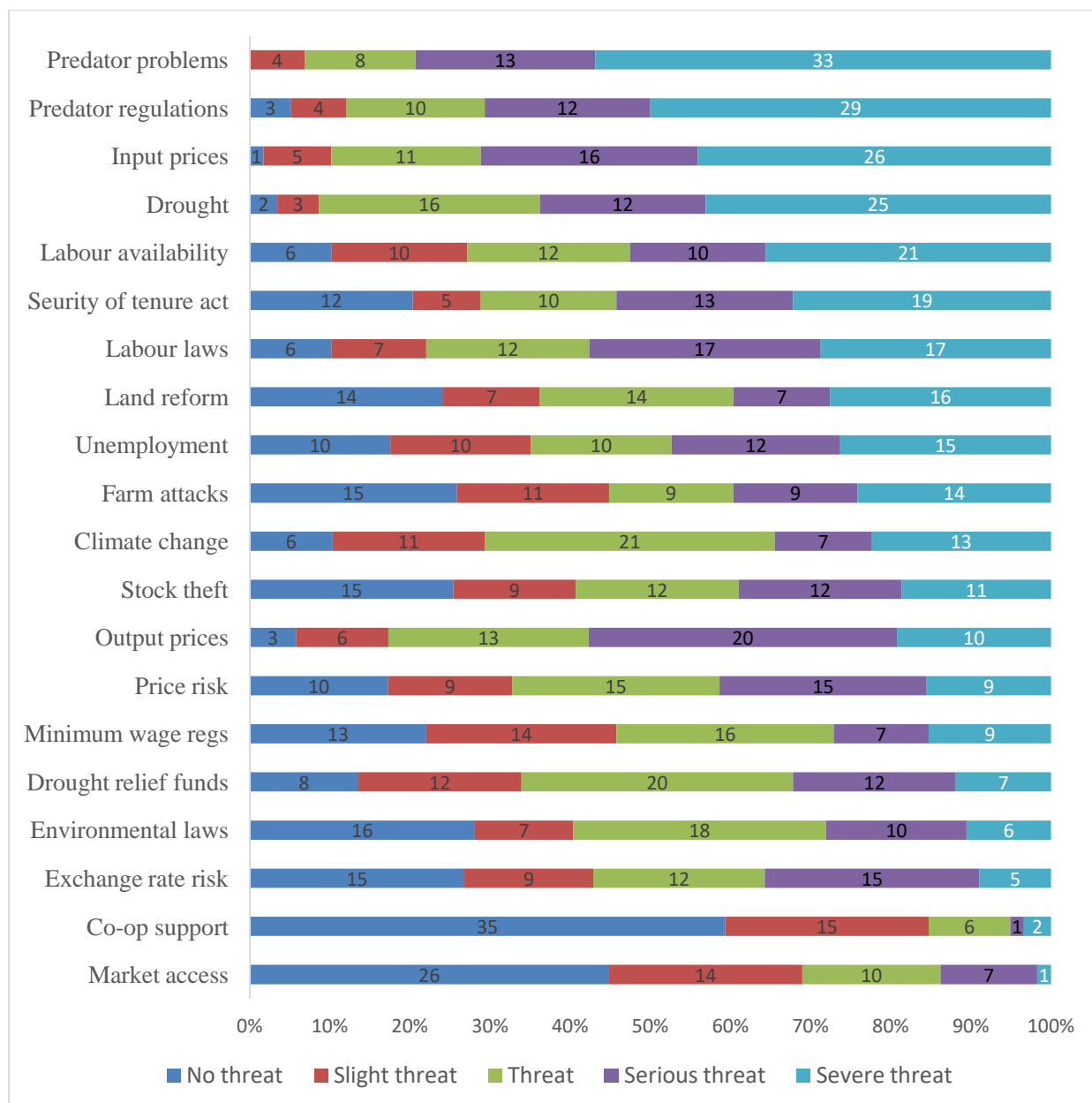


Figure 1: Karoo farmers' rating of twenty potential sources of perceived risk (n = 58)

The next step was to investigate the structure of farmers' risk perceptions. Table 1 which reports on principal component analysis, indicates that there were six principal components with Eigen values of ≥ 1 . Therefore by looking at these six underlying components of risk perceptions, which jointly accounted for 67% of the variance in the dataset, the complexity of the risk perceptions problem is greatly reduced. See the bottom of Table 1 for Eigen values and individual contributions to the cumulative variance explained. The rest of the table reports orthogonal (varimax) factor loadings, which are given in bold for factors that loaded strongly on a particular principal component. Since there were multiple associated factors for the first five principal components, five indices were constructed from standardised scores based on rotated factor loadings as indicated in equations 1-5.

Table 1: Rotated factor loadings of selected principal components of the covariance matrix

	Retained principal components					
	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6
Risk factors	Regulation	Prices	Rule of law	Climate change	Predators	Labour availability
Labour laws in general	0.7256	0.1605	0.0990	-0.0720	0.1218	0.3935
Security of Tenure Act	0.7519	0.3508	0.1649	-0.1035	0.0582	0.1274
Minimum wage regulations	0.8410	-0.0536	0.1736	0.1353	-0.0664	0.1011
Environmental laws in general	0.7599	0.2831	0.0101	0.1322	0.0415	-0.0410
Support from cooperative	0.1625	0.3920	0.1395	-0.2249	-0.5950	0.0634
Market access	0.0098	0.6214	0.3753	-0.1307	-0.0113	-0.1651
Rising input costs	0.1444	0.6632	0.1377	0.2985	-0.0379	0.3410
Falling output prices	0.0995	0.8362	-0.1269	-0.2129	0.0507	0.0832
Output price risk	0.3682	0.7612	-0.1197	0.1433	-0.0052	-0.0551
Exchange rate risk	0.3186	0.2207	0.5314	-0.1218	-0.0735	0.0336
Land reform	0.3936	0.2933	0.4926	-0.2931	0.1277	0.1035
Farm attacks	0.0321	0.0077	0.7992	-0.0823	0.1169	0.0288
Unemployment	0.1849	-0.0266	0.5749	0.1606	-0.1005	0.0720
Stock theft	0.1262	-0.1508	0.7829	0.1525	-0.0688	0.1324
Labour availability	0.3036	0.0863	0.1061	0.0010	-0.1827	0.8215
Predation problems	-0.2460	0.1013	0.0835	0.5360	0.5285	0.3021
Predator control regulations	0.2822	0.1156	0.0432	-0.0199	0.7638	-0.2662
Climate change	0.1690	-0.1146	0.3852	0.5259	-0.1475	0.2726
Drought	0.0919	-0.0317	-0.0445	0.8427	0.1079	-0.0928
Drought relief regulations	0.3842	0.3940	-0.1515	0.3623	-0.2703	-0.3638
Eigen values	5.0377	2.5162	1.9492	1.4553	1.3767	1.0853
Cumulative variance explained	0.2519	0.3777	0.4752	0.5479	0.6168	0.6710

Component 1, which was labelled “regulation”, neatly picked out all but one of the factors dealing with an aspect of the regulatory environment. Minimum wage regulation had a rotated factor loading of more than 0.8, while the Extension of the Security of Tenure Act, as well as environmental and labour laws in general had a factor loadings of more than 0.7. With scores of 0.38 and 0.39 drought relief regulation and land reform fell just short of the customary cut-off of 0.4. Since land reform loaded more strongly on component 3, it was not incorporated in the regulation index, but since drought relief regulations clearly also formed part of the regulatory environment, it was included here despite not quite making the cut-off. The regulation index which was constructed from rotated factor scores as follows:

$$\text{Regulation index}_i = 0.1972 \cdot \text{labour laws}_i + 0.2252 \cdot \text{environmental laws}_i + 0.1912 \cdot \text{ESTA}_i + 0.2821 \cdot \text{minimum wage}_i + 0.1044 \text{ drought relief regulations}_i \quad [1]$$

Component 2 was labelled “markets” as the factors “high input price”, “low output price”, “output price risk” and “market access” all loaded strongly onto it. In each of these cases the rotated factor scores were greater than 0.60. In addition, it was felt that the score of 0.392 on the factor “weak cooperative” was taken as sufficient evidence that this factor too belonged in the price index. A strong cooperative would be able to secure the best input and output prices for its members, and as such has an important role to play in reducing price variability. Since drought regulations reach farmers as fodder subsidy, it was not surprising that it too loaded relatively heavily on this component, although it was felt that it made more sense to include the factor drought relief subsidies in the regulation component.

The market risk index was constructed as follows:

$$\text{Markets}_i = 0.2345 \cdot \text{market access}_i + 0.2425 \cdot \text{input cost}_i + 0.2939 \cdot \text{output price}_i + 0.2291 \cdot \text{price variability}_i \quad [2]$$

Component 3 was initially labelled “security” as it loaded strongly onto stock theft and farm attacks with scores of 0.7829 and 0.7992 respectively. The score of 0.5749 on “unemployment” also still fitted with this label, as South Africa’s exceptional levels of unemployment is often linked to crime in the minds of ordinary citizens (Kamper & Steyn, 2007; Kingdon & Knight, 2004). However, the relatively high factor loading of 0.4926 on “land reform” pointed a broader concern over the rule of law. In the early 2000s South African farmers witnessed how the Zimbabwean police did nothing to protect white farmers when “war veterans” illegally occupied commercial farms in that country. These Karoo farmers are clearly think that there is a risk that South Africa’s market based land reform programme might deteriorate into lawless land grabbing that the South African police will be powerless, or unwilling, to prevent. To incorporate this extra dimension of concern, the “security” index was relabelled “rule of law”, which was calculated as follows:

$$\text{Rule of law}_i = 0.1542 \cdot \text{land reform}_i + 0.3303 \cdot \text{farm attacks}_i + 0.2156 \cdot \text{unemployment}_i + 0.3000 \cdot \text{stock theft}_i \quad [3]$$

Strong factor loadings of 0.8427 on “drought”, 0.5259 on “climate change” as well as a loading of 0.5360 on “predation problems” could have one argue that Component 4 should be labelled “the environment”. Similarly Component 5 could be labelled predators as it loaded strongly onto both “predation problems” whose score was 0.5285 and “predator control regulations” whose score was 0.7638, and on not much else. However, to avoid having the same factor load onto two components, it was decided to remove “predation problems” from Component 4 so that it could be retained in

Component 5. To reflect this change Component 4 was re-labelled “climate” and its associated index was constructed as follows:

$$\text{Climate index}_i = 0.6199 \cdot \text{drought}_i + 0.3801 \cdot \text{climate change}_i \quad [4]$$

Which left the predation index to be calculated as the weighted average of “predation problems” and “predator control regulations”:

$$\text{Predation index}_i = 0.4023 \cdot \text{predator problems}_i + 0.5977 \cdot \text{predator regulations}_i \quad [5]$$

Finally, since Component 6 had only one important element, namely “the availability of trustworthy labour”, this component was adequately represented by the underlying factor.

The five indices plus the factor labour availability were used to cluster cases on in a k-means procedure with $k = 3$. Although the original factors were integer, the indices became continuous (Greiner et al., 2011), which made single variable analysis of variance (ANOVA) appropriate for testing between-group differences. Where a specific ANOVA failed Bartlett’s test for equal variances, the Kruskal Wallis test was the non-parametric alternative. These tests revealed that index scores varied significantly by cluster membership at $p \leq 0.05$, except for the predator index which the three groups scored similarly.

According to Bonferoni’s pairwise comparisons (Baum, 1999) the middle cluster rated regulation and price risk more seriously than the other two clusters. See Table 2. In addition cluster 1 scored the risk of deterioration in the rule of law more seriously than the other two groups, while cluster 3 was less concerned about climate than the other two groups. Although there was a fair degree of consensus about the importance of predation risk, cluster 3 also rated this factor to be less important than the other two clusters, as was the case for climate risk. Finally, cluster 2 gave the lowest score for labour availability, while the other two clusters rated this factor above four. A mean of item means reveals that cluster 1 was the most fearful (mean of means = 4.04), followed by clusters 2 (3.13) and cluster 3 (3.01), whose overall views on these six dimensions of risk were relatively close together. The labels chosen were “scared” for cluster 1,” moderate small” for cluster 2 and “moderate large” for cluster 3.

The three most important concerns for the scared members of cluster 1 were the risks of labour availability, predation and regulation. For this group none of the indices scored less than 3.5, which indicates that its members were actually worried about all of the dimensions of risk. In contrast, the moderates each only worried about two dimensions of risk. The small moderates in cluster 2 identified predators as most important and climate risk as the second most important threat to the survival of their businesses. For the large moderates in cluster 3, the most important source of risk was labour availability followed by predators. The importance of this result is that it demonstrates the heterogeneity of farmers’ risk perceptions even in small tightly knit communities where risk attitudes are expected to be homogenous. The lesson here is that extension staff should not presume to understand risk perceptions after just one round of focus group meetings with a new target community, because focus groups tend to conflate views and to suppress the views of the silent majority so that extreme views tend to be over-represented in initial engagements, especially where negative perceptions of the capability / usefulness of the extension service are known to exist. It is much better in such circumstances to begin with a series of individual conversations which should be followed up with a properly coded community survey of risk perceptions and other attitudes.

Table 2: Cross-cluster differences in risk perceptions and farm and farmer characteristics

	Cluster 1 (n= 17)	Cluster 2 (n = 23)	Cluster 3 (n=12)	
Farm and farmer characteristics	Mean \pm std. deviation			Significance
Regulation risk index	3.94 \pm 0.68 ^a	2.79 \pm 1.08 ^b	2.41 \pm 0.56 ^a	F = 13.23***
Price risk index	3.74 \pm 0.73 ^a	3.03 \pm 0.95 ^b	2.56 \pm 0.61 ^b	F = 7.89***
Rule of law risk index	3.61 \pm 1.24 ^a	2.67 \pm 0.97 ^b	2.46 \pm 0.75 ^b	F = 5.80 **
Climate risk index	3.90 \pm 0.73 ^a	3.79 \pm 0.51 ^a	2.65 \pm 1.09 ^b	F = 11.78***
Predator risk index	4.38 \pm 0.80 ^a	4.22 \pm 0.87 ^a	3.67 \pm 0.99 ^b	F = 2.46 *
Labour availability risk	4.71 \pm 0.59 ^a	2.26 \pm 0.75 ^b	4.33 \pm 0.65 ^a	F = 73.93***
Farm size (ha)	6874 \pm 3484	6289 \pm 3076	9300 \pm 7174	χ^2 = 0.44
Size of breeding flock (#)	599 \pm 297	643 \pm 382	845 \pm 584	χ^2 = 1.36
% farm income	72 \pm 36	75 \pm 37	95 \pm 12	F = 3.821 †
Farmer's education (years)	12.9 \pm 1.6	13.2 \pm 1.4	13.3 \pm 2.1	F = 0.24
Wife's education (years)	13.2 \pm 1.8	13.2 \pm 1.4	12.8 \pm 2.3	F = 0.23
Farmer's age	49 \pm 10	55 \pm 13	57 \pm 11	F = 1.81
Management experience (years)	14.6 \pm 10.5 ^a	22.0 \pm 13.1 ^b	27.8 \pm 11.5 ^b	F = 4.39 **
Family labour (fte)	0.90 \pm 0.68	1.25 \pm 0.60	1.28 \pm 0.51	F = 2.08 †
Unit cost of production (R/ewe)	364 \pm 265	327 \pm 258	241 \pm 179	F = 0.92
Net farm income (R/ewe)	170 \pm 295 ^a	412 \pm 387 ^b	400 \pm 305 ^{a,b}	F = 2.77 *
Reproductive efficiency	72 \pm 14	89 \pm 37	80 \pm 14	χ^2 = 2.89
Predation (%ewes losing lambs)	8.7 \pm 6.7	8.9 \pm 9.3	8.3 \pm 9.4	F = 0.02
Use modern pregnancy checking	29%	13%	0%	χ^2 = 4.85*
Ram testing (5-pt Likert scale)	4.53 \pm 1.00 ^a	3.26 \pm 1.74 ^b	3.25 \pm 1.71 ^b	χ^2 = 7.65 **
Short breeding season (Likert)	4.12 \pm 1.26 ^a	3.57 \pm 1.44 ^{ab}	2.92 \pm 1.78 ^b	F = 2.31†
Sheep counting interval (days)	41 \pm 22	49 \pm 28	104 \pm 132	χ^2 = 1.383
Land too risky to lamb on (%)	38 \pm 32	24 \pm 28	20 \pm 24	F = 1.92 †
Drought feeding (months)	4.1 \pm 4.3	5.0 \pm 4.6	2.8 \pm 4.1	F = 1.05
Stocking density (ha /sheep)	14.2 \pm 6.5	14.8 \pm 10.7	10.6 \pm 3.9	χ^2 = 2.99
Don't rely on external info	24%	39%	8%	χ^2 = 3.87 †

***p \leq 0.001, ** p \leq 0.05, * p \leq 0.1, † p \leq 0.15^{a,b} means with the same superscript do not differ

Due to the very small available sample size it was necessary to relax the significance level $p \leq 0.15$. Still, there were not many farm and farmer characteristics that varied by cluster membership, which unfortunately restricts the ability of this analysis to explain the origins of these documented differences in risk perceptions. Amongst the household characteristics, the exceptions were share of household income from agriculture, which was significantly higher for cluster 3, years of management experience, which was significantly lower for cluster 1, and the size of the family labour pool, which was significantly lower for cluster 1. Amongst the farm characteristics unit profitability was significantly lower for cluster 1, whose farms also contained the large proportion of land too risky to lamb on.

If one thinks that the main division in risk perceptions is between the scared and the not so scared, the main determinants of risk perceptions are profitability, farming experience and the size of family labour pool. The members of cluster 1 run their farms on their own, with just 14 years of experience, compared to almost double that for the other two groups, one if four of whose members shares the burden of farm management with a partner. In cluster 1 the lack of farming experience was associated with lower levels of education and younger ages, as well flock and farm sizes that tended to be on the smaller side. In terms of the performance of the sheep enterprise itself, one sees that this group's flocks' reproductive performance tended to be the lowest, while their unit costs tended to be on the high side. These two outcomes can be directly attributed to a lack of management experience. Drilling down to what they do or believe to be necessary for successful sheep farming, we see that the members of cluster 1 were generally in support of modern farming practices. For example, they rated ram testing and the use of a limited breeding season to be more important than the other two group did, and they reported that they see their sheep more frequently than the other two groups do. In addition, they were more as twice as likely to be using ultrasound scans as pregnancy checking method. All these factors combined suggested that the members of cluster 1 compensate for their lack of experience with a greater reliance on external sources of information, as in fact three quarters of the group does. See Conradie (forthcoming) for an in-depth discussion of these farmers' information preferences.

With profitability, experience and the size of the family labour pool identified as the most important determinants of risk perceptions amongst these farmers, it becomes possible to understand their relative ratings. Labour availability risk comes to the top of the pile because people in this group do not have access to family labour to support their own labour and yet they believe that a relatively intensive management approach is the best. Moreover, a lack of experience probably poses great risks for the productivity of hired labour, which also explain why these farmers are so concerned about labour availability. Predation was identified as this group second most important concern, which is unsurprising as each lamb lost to a predator has a direct bearing on the profitability of the sheep enterprise, a lack of which is this group's main weakness. The source of risk rated third most important was regulation risk, which in this case affects farming performance through the introduction of more red tape affecting land use and employment decisions. Clearly limited management capacity will affect how the risk of more red tape is perceived. Finally, the fourth most important risk as identified by these farmers was climate risk. Table 2 shows that cluster 1 and 2's relatively high stocking density resulted in them having had to feed livestock for a longer period during the recent 2011/12 drought. The financial implications of paying for feed obviously affects how seriously drought and climate change are perceived to be, especially amongst farmers who are already not very profitable to begin with.

As indicated above, the members of clusters 2 and 3 expressed a common concern about predation problems, in addition to which cluster 2 worried about climate risk and cluster 3 worried about labour availability. The only characteristic available to explain these differences with, was the share

of household income from agriculture, which differed by twenty percentage points between clusters 2 and 3. Cluster 3's much greater reliance on agriculture was associated with a non-significant tendency to operate larger flocks on larger farms, which goes a long way towards explaining the observed differences. Firstly, there is an obvious link between farm size and concerns about labour availability that results from having to supplement family labour with hired labour on large properties. Secondly, although both clusters were significantly more profitable than cluster 1, a larger farm size implies the existence of a financial buffer that explains why cluster 3 rated all other sources of risk as less of a threat than cluster 2 did. Thirdly, we can also see from the data why climate risk was rated so highly by cluster 2. Despite a 50% lower stocking density than was reported for cluster 3, Table 2 shows that cluster 2 was more severely affected by the 2011/12 drought than cluster 3 was. The proxy for the intensity of the 2011/12 drought was the number of months that livestock had to be kept alive on purchased for during the previous twelve-month period. This figure was twice as high for clusters as it was for cluster 3. Finally, none of this explains why predators were perceived to be so important by two groups of farmers who were both reasonably profitable. The reasons probably differ for the two groups. Just like for cluster 1 it could be argued that any loss to predators directly affects the bottom line, which must be a source of concern for anyone with a small farm. For the owners of the bigger farms predator problems exponentially increases labour cost, which is already a concern.

The main implication of the results in Table 2 is this: income affects all risk perceptions. A series of Pearson's correlations revealed that net farm income per breeding ewe in the flock was negatively and significantly (at $p \leq 0.20$) correlated with all components of risk except predation. Since we also know that risk perceptions affect investment decisions and technology adoption (Størdal, Lien, & Hardaker 2007; Marra, Pannell & Gadim, 2003; Beal, 1996), it is useful to think about which of these three groups might be the early adopters of predation or climate change mitigation strategies, or in fact any other recommendations for improved output that the extension service might want to promote. Unfortunately adoption data were simply not collected in Wave 1, but what we see in Table 2 appears to be an inverse relationship between income and the way that farmers think about best practice sheep farming methods. For example, when it comes to the importance of ram testing, farmers who rate the practice as irrelevant or unimportant, reported net farm incomes of above R550 per ewe in the flock while those who rated it as very important, reported earnings of less than R250 per ewe in the flock. In this case the ANOVA result was $F = 1.75$ ($p = 0.1408$). This simply means that those who are well off enough do not need to innovate and therefore are not particularly likely to be early adopters.

4. CONCLUSION

This paper investigated the structure of farmers' risk perceptions with principal component analysis. It found that some elements of perceived risk were related, for example, that farmers mostly thought the same way about regulation regardless of the purpose of the regulation or that they were just as concerned about high input prices as they were about market access and output price risk. The six themes represented by the principal components were incorporated in a subsequent cluster analysis which identified three distinct subgroups of farmers with homogenous risk perceptions. These results indicated that even in small apparently homogenous communities such Laingsburg in the Central Karoo not all farmers perceive the same risk in the same way. This is why perception surveys ought to become part of the extension service's regular workload and why such a survey should always be the first step of any proposed intervention in the system. When it came to explaining observed differences in risk perceptions, most explanations revolved around differences in management experience and profitability. The extension service can influence both. Existing agricultural training programmes should be maintained and strengthened while more opportunities for internships and

mentorships will create opportunities for aspirant farmers to gain experience before embarking on independent farming. To summarise, despite Karoo agriculture's very low input character, the remaining employers of wage labour are concerned about labour availability. It was also shown that the ownership of small, marginal farms undermines profitability, which in turn shapes how these farmers think about and interact with the rest of society. Here climate change is the silent deadly killer, which creeps up on agriculture unnoticed, and can rob the sector of its positive contribution to society. More work is urgently needed how risk perceptions affect adoption and investment decisions.

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ANALYSIS OF SUBSISTENCE FARMERS' PERCEPTIONS ON CONSERVATION AGRICULTURE PRACTICES IN HONG LOCAL GOVERNMENT AREA OF ADAMAWA STATE, NIGERIA

Donye, A. O.,⁵⁹ Akeredolu, M.,⁶⁰ Nuhu, H. S.⁶¹ & Emmanuel, A. S.⁶²

Correspondence Author: A. O. Donye. Email: andrewdonye@yahoo.com

ABSTRACT

The study analyzed Subsistence farmers' perceptions on conservation agriculture in Adamawa State, Nigeria. A total of 100 farmers were selected for the study, using multi-stage random sampling technique. A pre-tested and validated structured questionnaire was administered by means of interview schedule in generating the data analyzed. Descriptive statistics (frequencies, percentages and means) were employed in the analysis of the farmers' socio-economic characteristics, whereas the Likert-type scale grading was used to assess the farmers' perception on the effects of conservation agriculture practices on crops, soil, environment, inputs and labour. Results of study revealed that farmers have agreed that conservation agriculture has very important positive effects on soil, crops, environment, inputs and labour. The respondents were undecided on whether conservation agriculture practices do promote and enhance natural biological processes above and below the soil. They were also undecided on whether conservation agriculture improves the resilience of agricultural cropping systems. The major barriers identified which hinder the practicing of conservation agriculture were that: mulching is too difficult when compared to slash and burn practice; and, it takes too long to see the benefits of conservation agriculture. It was concluded that farmers perceived and are fully aware of the general importance of conservation agriculture practices, but they have not adopted it fully. It was recommended, among others, that extension workers should organize educational trainings, short courses, workshops and symposia for farmers and emphasize on the need for them to adopt conservation agriculture.

Keywords: Analysis, Subsistence Farmers, Perceptions, Conservation Agriculture, Practices, Nigeria.

1. INTRODUCTION

In many regions of sub-Saharan Africa, continuous cropping and use of inappropriate farming practices have had massive negative environmental impacts characterized by declining soil fertility and erosion, degradation of vast expanses of arable land further causing low yields, food insecurity and perennial starvation (Guto, Pypers, Vanlauwe, De Ridder, & Giller, 2011). These problems are particularly intense in poor developing countries, where more than 80% of the populations of subsistence farmers still rely on simple traditional technologies and tools. Land scarcity, increasing population pressure, poorly targeted agricultural policies and agricultural management strategies exacerbate the problem. However, society has created nature conservation and environmental programs to counter these negative trends, for example, agro-environmental schemes within

⁵⁹ Department of Agricultural Economics and Extension, Adamawa State University, Nigeria. Email Addresses: andrewdonye@yahoo.com Phone Numbers: +2348037848063 +2348050885484.

⁶⁰ Sasakawa Africa Fund for Extension Education, West Africa

⁶¹ Department of Agricultural Extension Services, University of Maiduguri, Nigeria

⁶² Department of Agricultural Economics and Extension, Adamawa State University, Nigeria.

European Union (Guto *et al.*, 2011). These programs compensate farmers for the production of common goods and services, but also adopting environmentally friendly production strategies.

There are various methods or approaches to agricultural production which differ with places, availability or non-availability of natural and other resources among many factors. There are also many crop cultivation approaches which aim at reducing the deterioration of cultivable lands. Conservation agriculture is one of these approaches. Dumanski, Peirette, McGarry, & Pieri, (2006) defined conservation agriculture as the application of modern agricultural technologies to improve production, while concurrently protecting and enhancing the land resources on which production depends. This has, in turn, contributed to the adopters' ability to attain improved livelihoods because it has enabled them to produce high crop yields while reducing production costs, maintaining the soil fertility and conserving water. Desperch (2005) reported that zero-tillage, which is one of the major practices of conservation agriculture, is now applied on more than 95 million hectares worldwide, primarily in North and South America.

Permanent cover crops and non-removal of residues have the ability to protect the soil from erosion and weeds. Varied crop rotation helps in weed control, while also boosting the fertility of the soil. Conservation agriculture is a part of sustainable agriculture that combines best practices with discontinuation of production systems associated with negative environmental externalities created by conventional agriculture (D'Souza, Cyphere, & Philips, 1993). It is against this background that this study analyzed rural people's perception on conservation agriculture.

1.2 Statement of the Problem

It is commonly known that awareness plays a key role in farmers' adoption process. Conventional agricultural production practices have been associated with progressive soil degradation, erosion and soil nutrient content depletion. The application of conservation agriculture promotes the concepts of optimizing yields and profits, while ensuring the provision of local and global environmental benefits and services. Its adoption has helped farmers in many countries to conserve desired characteristics of their farmlands.

According to Desperch (2005), the area under zero-tillage on the African continent represents only 0.3% of the area worldwide. These figures have implied that only a relatively very small area is cultivated in Africa under conservation agriculture. Though no specific land area has been empirically reported as being put to zero-tillage in Nigeria, it is apparent from the percentage area reported as being under zero-tillage in Africa that only conservation agriculture is being practiced on only a small area. This poses a very serious matter of concern and worry, taking into cognizance the great advantages and benefits believed to be associated with conservation agriculture practices.

The low percentage of land area on which conservation agriculture is practiced in Africa requires answers to some important questions. Are farmers in Africa not aware of the soil conserving effects of conservation agriculture practices or do they have negative perceptions on its practices? There is a need for agricultural extension experts in Nigeria to find answers to these questions. It was against this backdrop that this study analyzed rural farmers' perceptions on conservation agriculture practices in the study area.

1.3 Objectives of the Study

The main objective of the study was to analyze rural farmers' perceptions on conservation agriculture practices in Hong Local Government Area of Adamawa State, Nigeria. The specific objectives were to:

- i. identify the socio-economic characteristics of the respondents;
- ii. investigate subsistence farmers' perceptions on conservation agriculture practices; and,
- iii. identify the barriers to acceptability of conservation agriculture by subsistence farmers.

1.4 Significance of the Study

The study will provide an insight on the perceptions of farmers on conservation agriculture in Hong Local Government Area of Adamawa State, Nigeria. The findings of the study will therefore, provide information to policy makers in planning effective agricultural programmes, especially those related to the type of agricultural practices to be engaged in by farmers in the country. The findings of the study will also provide knowledge to rural development stakeholders on the need to embark on campaigns, workshops and/or seminars that promote the adoption of conservation agriculture practices. The study will serve as a reference material for students and researchers who are interested in carrying out similar or related studies. The findings of the study will also provide essential guide to extension workers with regards to educating farmers on the positive effects of conservation agriculture and its accompanying benefits in agricultural production and productivity.

2. METHODOLOGY

2.1 Source of Data and Methods of Data Collection

Both primary and secondary information were used for analysis in this study. The primary data were generated through the use of structured questionnaires, which were administered to the respondents by means of interview schedule. Secondary pieces of information were obtained from journals and records from the Adamawa Agricultural Development Programme (ADADP) and farmer associations. Other sources of information were the internet and textbooks. Trained ADADP extension agents were employed to administer questionnaires designed for the study during the process of data collection.

2.2 Sampling Procedure and Sample Size

The study area has twelve (12) existing political wards. Five (5) of the wards were selected, using simple random sampling technique. Four (4) villages were selected from each of the selected wards and five (5) respondents were selected from each of the twenty (20) selected villages. Thus, a total of one hundred (100) rural people served as the respondents from whom the data used for analysis in the study were generated.

2.3 Analytical Techniques

The data generated from the survey were analyzed using both descriptive statistics and the Likert-type ranking technique. Thus, frequencies and percentages were used to analyze objectives i and iii, whereas the Likert-type ranking technique was employed to address objective ii. In this case, the respondents' perceptions were determined by measuring their attitudes towards the positive and negative statements contained in the questionnaire. Hence, their perceptions were measured using a 5-point Likert-type rating scale by scoring their responses as follows: Strongly Agreed (SA) = 5; Agreed (A) = 4; Undecided (U) = 3; Disagreed (D) = 2; and, Strongly Disagreed (SD) = 1. The mean score of the responses was calculated to be 3. It was therefore, decided that any mean score greater

than or less than 3 points represented the respondents' collective perception on the statement in question as strongly agreed or strongly disagreed, respectively. A reverse scoring approach was, however, developed for negative statements. This was done in order to avoid a situation whereby the respondent would respond in the same pattern by ticking without necessarily thinking. For this reason, the positive and negative statements were juggled in the research instrument in order to prompt their thoughtful responses.

3. RESULTS AND DISCUSSION

3.1 Socio-economic Characteristics of the Respondents

Results in Table 1 show the distribution of the respondents based on their age. The table shows that 32% of the respondents were between 18-30 years, 47% were between 31-50 years, 17% were between 51-70 years and 4% were 71 years and above. This shows that most (47%) of the respondents were between 31-50 years, which also represent an economically active age range.

Table I: Distribution of the Respondents Based on Socio-economic Characteristics

Variable	Frequency	Percentage (%)
Sex		
Male	53	53
Female	47	47
Age (Years)		
18-30	32	32
31-50	47	47
51-70	17	17
Above 70	04	04
Marital Status		
Single	22	22
Married	78	78
Level of Education		
No formal Education	15	15
Primary School	32	32
Secondary School	22	22
Post-Secondary	31	31
Farming Experience		
1-10	46	46
11-20	31	31
21-30	13	15
>30	08	08
Family Size		
1-10	80	80
11-20	18	18
> 20	02	02
Annual Income (₦)		
20,000-100,000	46	46
101,000-300,000	38	38
> 30,000	16	16
Total	100	100

Source: Field Survey, 2016.

Furthermore, results in Table 1 indicate that 53% of the respondents were males and 47% were females. This shows that more than half of the respondents were males. The reason for this could be

attributed the fact that, under normal circumstances in Africa, men are the heads of their respective families and have a lot of responsibilities attached to them. Therefore, many of them are involved in agricultural production. From the results, it could also be inferred that many women are into agricultural production to meet up with their own family needs.

The distribution of the respondents based on household size indicates that 80% were with the household size range of 1-10, 18% were within the range of 11-20 and 2% fall within the range of 21 members and above. This shows that the range with the highest percentage (80%) is 1-10. However, the results show that the range with the highest number of household members is 11-20, which constituted 18% and those with 21 members and above constituted the lowest percentage (2%). The results on the table show that 46% of respondents have farming experience of 1-10 years, 31% have the farming experience of 11-20 years, 15% have 21-30 years and 8% have 31 years and above. The results show that the respondents with the lowest percentage (8%) were those within the range of 31 years and above. This may be attributed to the fact that for a farmer to have experience of up to or above 31 years, he is likely to be very old and not many of such people are found in a given society.

The table also presents that the annual income of the respondents. The results indicate that 48% of them have ₦20,000-₦100,000, 36% have ₦101,000-₦300,000 and 16% have above ₦301,000. From the distribution, the respondents within the highest annual income range are few, constituting only 16%. This may be because most people with capital prefer to invest in other businesses other than farming since, in Africa, most farmers are small-scale holders. The table shows that 48% of the respondents earn ₦20,000-₦100,000. This may be because of the fact that most farmers produce food just enough to feed their nuclear families. Giller, Witter, Corbeels & Tittonell, (2009) also stated that farmers' involvement in conservation agriculture tends to be done mainly by more wealthy farmers, which could be attributed to the fact that in most cases, wealthier households are more likely to join most governmental and non-governmental interventions projects.

The table shows that 15% of the respondents have no formal education, 32% have attended primary school, 22% have attended secondary school and 31% have post-secondary education. This shows that only few of the respondents have no formal education. Moreover, the table shows that 78% of the respondents are married and 22% are single. The reason why majority (78%) of the respondents are married may be attributed to the fact that married people have responsibilities more than those who are not and so they need to cultivate crops in order to provide food for their family members.

3.2 Subsistence Farmers' Perceptions on Conservation Agriculture

Table 2 presents the results of farmers' perceptions on the effects of conservation agriculture practices on soil. The results indicated that the mean score for the respondents' perceptions on the statements that conservation agriculture improves soil structure and composition is 4.5. This implies that the respondents have agreed that conservation agriculture does improve the structure of the soil and its composition.

Table 2: Subsistence Farmers' Perceptions on the Effects of Conservation on Soil

Effect of Conservation Agriculture on Soil	Mean Score
It improves soil structure and composition	4.5
It reduces soil erosion and degradation	4.5
It enhances water retention capacity	2.9
It promotes/enhances natural biological processes above and below the soil	3.0
It promotes soil fertility due to decomposition of crop residue and cover crop	4.4
It protects the soil physically from the sun and rain	4.1

Source: Field Survey, 2016.

The response mean score for the statements that conservation agriculture: (i) reduces soil erosion and degradation is 4.5; (ii) enhances water retention capacity of the soil is 2.9; (iii) promotes and enhances natural biological process above and below the soil is 3.0; (iv) promotes soil fertility due to decomposition of crop residue and cover crops is 4.4; and, (v) protects the soil physically from the sun and heavy rains is 4.1. This means that the respondents have strongly agreed with all the statements for which they responded. However, the results indicate that the respondents had disagreed to the statements that conservation agriculture enhances water retention capacity of the soil. This now reveals that they have negative perceptions on these aspects of conservation agriculture practices, which, in reality, are supposed to have attracted strong positive perceptions.

3.3 Subsistence Farmers Perceptions on Effects of Conservation Agriculture on Crops

Table 3 presents the results of the farmers' perceptions on effects of conservation agriculture on crops. The results indicated that the respondents have agreed that: crop rotations and crop mixes produce a range of crops by obtaining a mean score of 4.3; mix of crops reduces losses because if one crop fails the other remains with a mean score of 4.3; mix of crops increases crop yields with a mean score of 4.2; mix of crops improves green coloration of crops which in turn enhances photosynthesis with a mean score of 4.0; conservation agriculture improves the resilience of agricultural cropping systems by a mean score of 3.9.

Table 3: Subsistence Farmers' Perceptions on Effects of Conservation Agriculture on Crops

Effects of Conservation Agriculture on Crops	Mean Score
Crop rotations and crop mixes produce a range of crops.	4.3
Mix of crops reduces losses if one crops fails.	4.3
Mix of crops increases crop yields.	4.2
Mixed crops improve green coloration thereby enhancing photosynthesis.	4.0
It helps to improve the resilience of agricultural cropping systems.	3.9

Source: Field Survey, 2016.

The results imply that the respondents have agreed that all the statements in Table 3 are true. This, therefore, means that the farmers are much aware of the advantages of conservation agriculture practices on crops.

3.4 Subsistence Farmers' Perceptions on Effects of Conservation Agriculture on Environment

Table 4 presents the results of farmers' perception on the effects of conservation agriculture on the environment. The results indicated that the respondents have agreed to the effects of conservation agriculture on the environment, because all the mean response scores for all the statements are above 4 points.

Table 4: Subsistence Farmers' Perceptions on Effects of Conservation Agriculture on Environment

Effects of Conservation Agriculture on Environment	Mean Score
It contributes to environmental conservation	4.0
It enhances use of natural resources like soil, water and other microbes	4.1
It assists in the adaptation to climate change	4.3
It reduces erosion	4.0
It conserves natural ecosystems	4.6

Source: Field Survey, 2016.

3.5 Subsistence Farmers' Perceptions on Effects of Conservation Agriculture on Costs of Inputs/Labour.

Table 5 presents the results of the farmers' perceptions on the effects of conservation agriculture practices on cost of inputs and labour. The results indicated that the respondents have agreed that conservation agriculture reduces the cost of inputs and labour since all the mean scores are above 4 points.

Table 5: Subsistence Farmers' Perception on Effects of Conservation Agriculture Costs of Inputs and Labour

Effects of Conservation Agriculture on Costs of Inputs and Labour	Mean score
It reduces the use and costs of inputs, e.g. fertilizers, herbicides, etc.	4.1
It reduces the cost of labour, e.g. ploughing and harrowing	4.5
It prevents the buying and use of mould-board ploughs, disks and harrows	4.5
It reduces the cost of weeding due to the effects of cover crops	4.5

Source: Field Survey, 2016.

3.6 Barriers to Acceptability of Conservation Agriculture by Subsistence farmers

From the results presented in Table 6, 29.4% of the respondents indicated that inappropriate transportation infrastructure is a major barrier to acceptability of conservation agriculture. More than half (18.1%) of the respondents show that mulching is more difficult than slash and burn.

Table 6: Barriers to Acceptability of Conservation Agriculture by Subsistence Farmers

Constraints to the Practice of Conservation Agriculture	*Frequency	Percentage
Limited access to input	8	2.7
Insufficient resources to grow cover crops	17	5.8
Lack of sufficient equipment for planting	13	4.4
Lack of relevant skills and knowledge	11	3.8
Lack of adequate extension services	16	5.5
Inadequate farm size	21	7.2
Insufficient human capital	19	6.5
Absence of Mechanization	7	2.4
Inappropriate transportation infrastructure	86	29.4
Mulching is more difficult than slash and burn Practices	53	18.1
It takes longer period to see benefits	42	14.3
Total	293	100

Source: Field Survey, 2016.

*Multiple responses were observed.

Those who opined that it takes longer period to see the benefits constituted 14.3%. With this result, it is apparent that the respondents have only few barriers to acceptability of conservation agriculture. Inappropriate transportation infrastructure was also found by other researchers to be a serious bottle neck to the adoption of conservation agriculture practices (Cram, 2000; Desperch, 2005; Friedrich, Kassam, & Taher, 2009).

4. CONCLUSION

Most of the respondents in the study area are aware of conservation agriculture practices and have accepted most of its practices as good. In spite of this, none of the respondents has adopted its practices fully. Each of the respondents practices only some aspects of conservation agriculture but not in its totality. This suggests that the extension workers, who are supposed to convince farmers to the point of adoption, did not do enough of their work. The respondents have not received the appropriate assistance in terms of the materials and inputs needed to facilitate convince them into practicing conservation agriculture. The farmers on their part do not look at conservation agriculture practices from the perspective of its long term benefits, but have failed to adopt because of their desire for immediate and short term results and benefits.

5. RECOMMENDATIONS

Based on the results of the study, the following recommendations were made: (i) the government of Nigeria should provide the rural areas with good transportation infrastructure such as good roads and bridges; (ii) Extension workers should emphasize the importance of conservation agriculture practices to rural farmers and convince them to adopt; and, (iii) government should empower farmers through the provision of loans and credits to enable them acquire the equipment needed for the practice of conservation agriculture.

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