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**REPUBLIC OF NAMIBIA**  
**MINISTRY OF AGRICULTURE**  
**WATER AND RURAL DEVELOPMENT**

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**BASELINE SURVEY OF THE IMPACT OF**  
**AGRICULTURAL EXTENSION SERVICES**  
**IN OSHIKOTO REGION**

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**DIRECTORATE OF EXTENSION AND ENGINEERING SERVICES**

**Tsumeb, October 2003**



Photo above: enumerator at work

Photo cover: cattle in the so called Okashana grasslands north of the Etosha National Park

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## ACRONYMS AND ABBREVIATIONS

AAF	Affirmative Action Farms
ADC	Agricultural Development Centre
AEO	Agricultural Extension Officer
AET	Agricultural Extension Technician
AIDS	Acquired Immune Deficiency Syndrome
ARDC	Agricultural Rural Development Centre
BSF	Belgian Survival Fund
CAEO	Chief Agricultural Extension Officer
CAET	Chief Agricultural Extension Technician
CBO	Community-based Organisation
CBS	Central Bureau of Statistics
CPU	Central Processing Unit
DAP	Draft Animal Power
DART	Directorate of Agricultural Research and Training
DEES	Directorate of Extension and Engineering Services
DRWS	Directorate of Rural Water Supply
DVS	Directorate of Veterinary Services
EU	European Union
FED	Farmer and Extension Development
FSRE	Farming Systems Research & Extension
HIV	Human Immunodeficiency Virus
IFAD	International Fund for Agricultural Development
MAWRD	Ministry of Agriculture, Water and Rural Development
NASSP	Namibia Agricultural Support Services Programme
NCA	North Central Areas
NDP1	First National Development Plan
NDP2	Second National Development Plan
NGO	Non-governmental Organisation
NNRDP	Northern Namibia Rural Development Programme (1994-99)
NOLIDEP	Northern Regions Livestock Development Project (1996-2004)
NOREESP	Northern Regions Extension & Epidemiological Support Programme (2000-4)
RDSP	Rural Development Support Programme (1995-99)
REMP	Research and Extension Management Programme (2000-04)
SME	Small and Medium Enterprise
TV	Television
UNAM	University of Namibia
UNCBD	United Nations Convention on Biodiversity
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
VCF	Veterinary Cordon Fence
VCR	Video Cassette Recorder

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Mr K.A. Amufufu and Mr G. Mukuahima undertook the questionnaire survey and the preparation of this report in collaboration with the rest of the DEES team in Oshikoto region.

## **Disclaimer**

The views expressed in this report are the responsibility of the authors, and do not necessarily reflect those of the Ministry of Agriculture, Water and Rural Development.

## **PART ONE**

### **0 FOREWORD**

Government's annual operational expenditure on agricultural extension services has averaged about N\$ 50 million over the last few years. In addition, international donors have contributed roughly N\$ 10 million per year to both operational and capital expenditure. Agricultural Development Centres are found all over the country staffed by qualified officials equipped with vehicles and provided with operational budgets. But, is the extension service achieving what it sets out to do?

This is a report on a baseline study designed to survey selected indicators of extension impact during the 2002/03 farming season. We intend to repeat this survey after the 2006/07 seasons to gauge change over the period between the baseline survey and the final survey. This period coincides with the span of NDP 2, which is the basic planning timeframe of the extension service.

Our collaborators, as well as the Namibian public at large have made calls for an assessment of the impact of agricultural extension services. These are the people who ultimately control our purse strings; and as competition for government resources increases, we want to assess whether what we are doing is worth supporting.

As managers, we also want to know whether all the effort we are putting in is actually bearing fruit. If we find, for example, that, after years of promoting a particular farming technology or practice, farmers are simply not interested and have not adopted it, we will obviously need to think again. What are we doing wrong? Is it the wrong technology? Are our methods failing? How can we improve?

We are approaching the task of impact assessment by gathering quantitative information using formal questionnaires and qualitative information using informal, participatory methods. The two approaches need to be integrated; qualitative methods need to build on quantitative.

This report presents the results of a regional questionnaire baseline survey that has produced, we believe, objective results. Each region has designed and managed its own survey. This reflects our decentralised organisational structure, which operates regional programmes in response to regional realities.

This report focuses on the Oshikoto region, and is being distributed to you as important collaborating partners and stakeholders in the cause of regional development. We hope you find it interesting and informative and we look forward to increasing collaboration in future.

D.R. Tshikesho  
DIRECTOR OF EXTENSION AND ENGINEERING SERVICES  
October 2003

## 1 EXECUTIVE SUMMARY

How can we prove that changes in farmer welfare, farm production and income, and changes in farmer behavior have occurred because of the work of the agricultural extension service? A baseline survey on extension impact on communal farmers was conducted as part of the process of addressing the above question. The survey was conducted from 12<sup>th</sup> May to 22<sup>nd</sup> May 2003 in randomly selected villages in Oshikoto region. This was a “closed questionnaire” survey. Prior to the commencement of the survey, a questionnaire pre-testing was conducted to determine the weakness and clarity of the questions, in four randomly selected villages.

It is indeed difficult to make causal linkages between the work of extension services and changes in farmer’s behaviour. This baseline survey looked at indicators of farmers’ behaviour and perceptions relating to their awareness, understanding and adoption of recommendations being promoted by extension services in the region, during the 2002/03 farming season. In many cases it was found that, at this stage, farmers hardly use many of the innovations that extension has introduced and promotes, notably a number of routine animal husbandry practices, the marketing of both livestock and crops, and cultivation of new cultivars. Few farmers are marketing their agricultural commodities in Oshikoto region, and “open markets” prove to be the best available markets for both crop and animals products.

On the other hand, the findings of the survey indicate some areas in which the extension department appears to be succeeding in promoting innovation. Apparent successes include the use of manure, pest control, the use of draft animal power, and the use of radio to broadcast agriculture related information. Even though there are fewer farmers who are using DAP implements for weeding, two-thirds of the respondents acknowledge the advantage of DAP over the hand hoe. The shortage of these implements in local markets restricts the farmers from using DAP to weed. Over 90% of the respondents indicated that they intercrop their local cereal crop with both vegetables (especially watermelons and pumpkins) and leguminous crops. More than 90% of the farmers use granaries for storing their crop produce. Ash is used to prevent the pest infestations in these containers.

It is intended to repeat this survey after the 2006/07 season in order to gauge change related to these indicators over the period between the baseline survey and the final survey. This period coincides with the span of NDP 2, which is the basic planning timeframe of the extension service. It is hoped that increases in awareness, understanding and adoption of extension recommendations will then be evident.

The report also provides information on the agricultural situation in the region, as well as on the nature of extension services that are offered. This reveals the limited resources the Ministry is working with, including deficiencies of qualified personnel, operational equipment, limited budget to fund new projects and office buildings. One major constraint experienced is the high number of farmers in relation to the low number of front line extension workers employed.

## 2 INTRODUCTION

### 2.1 WHAT AGRICULTURAL EXTENSION SERVICES DO AND WHO THEY SERVE

Up until recently the government's agricultural extension services were focussed mainly on providing subsidised agricultural services (e.g. ploughing, farming input sales, the development and maintenance of farm infrastructure), and the administration of government programmes such as drought relief and credit schemes. In the mid-1990s, things began to change as it was realised that many of these services were not benefiting the mass of farmers and, in any case, were often best provided by the private sector.

New approaches stressed the provision of advisory, information, communications and farmer training services. Extension services aim to help farmers to develop and adopt improved farming technologies and practices, to organise themselves into self-help groups of various sorts, and to better interact with the world of agricultural markets, services, infrastructure, laws and policies in which they operate. In some places extension has been playing more of a facilitating role relating to a range of rural livelihood issues.

At the same time, greater attention was given to the communal sector, where extension services were supposed to target all farmers. Efforts were made to reach farmers by working with farmers' groups and through the mass media, and through various methods designed to impact on numbers of farmers, such as demonstrations, shows, and training courses.

### 2.2 QUESTIONNAIRE SURVEY RATIONALE

#### **Extension impact: can you prove it?**

This section discusses some of the conceptual and practical difficulties involved in trying to assess the impact of agricultural extension services.

How can we prove that changes in farmer welfare, farm production and income, and changes in farmer behaviour (which we can define as including increased farmer knowledge and skills, improved farm technology, farm management practice, and farmer organisations) have occurred because of the work of the agricultural extension service? Many variables influence such changes (for example, other sources of information, rainfall, market prices, availability of credit, health issues, and so on) of which extension may or may not be one. It is notoriously difficult to make a causal linkage between the work of extension services and changes in farmer behaviour, let alone farm production, and ultimately welfare.

This is different from other services. In the field of education, for example, we have exam results, in the field of health we have hospital records, in the field of transport we have roads built and maintained, all clearly visible and easily measurable indicators.

#### **Impact on who?**

The agricultural extension service uses different methods to address individual farmers, groups of farmers and the broad mass of farmers, be it information meetings, demonstrations, training, or mass media. Ultimately, the mandate of the extension service is to serve all farmers. Therefore, this baseline study looks at the impact of extension activities on the broad community of farmers. The rationale for this is that although extension recognises that it cannot directly contact all farmers, it believes that its influence ultimately reaches all farmers through normal farmer-to-farmer dissemination. This assessment does not look at the impact of specific

activities on immediate beneficiaries, for example on trainees who have been exposed to specific training activities.

### **Different types of impact**

The DEES has drawn up a logical framework that describes its main activities and their relationship to a set of objectives (see page 11). The logframe describes extension activities, which should deliver clear outputs, which in turn should contribute to the achievement of a broader purpose, which itself will contribute to a more general goal. It is the job of the extension service to carry out the activities and deliver the outputs.

For extension managers, it is most important to assess impact at the output level: that is to look at service delivery and changed farmer behaviour, as defined above. Changed farmer behaviour should, in turn, lead to the achievement of higher-level objectives (e.g. improved yields, better risk management, and increased incomes), although these are also subject to many other influences (e.g. rain, market prices, etc.).

Extension services provide information, advice and training to enable farmers to be better managers by enabling them to develop and adopt better technologies and farm management practices, and by being better organized for different types of collective action. We can measure the extent this has happened by looking at rates and degrees of change in farmer practices and management.

To do this we can break down the process of such change into a number of stages – and look at how much of each has occurred with regard to specific changes being advocated. Change requires that farmers have:

1. contact with extension (either directly through participating in activities with AETS or visiting demos, or ADCs, or indirectly through the radio or other farmers who have learned directly from extension);
2. received information, advice or training on the innovation from extensionists;
3. understood the information, advice or training on the innovation;
4. tried out and adapted the innovation to their specific needs; and
5. acted upon or adopted the innovation.

We measure this by looking at indicators of:

- Extension-farmer contact and farmer satisfaction with extension services
- Farmer awareness, understanding, adoption and change

Extension impact assessment aims to review the extent to which these things have taken place, first through revealing the baseline situation, and later through reviewing how things have changed over time.

Concerning extension-farmer contact and farmer satisfaction, we can measure this by asking about the extent farmer involvement with extension activities, and their perceptions of that involvement. Regarding farmer awareness and adoption, we select specific agricultural development issues to focus on. We cannot ask farmers about all the different technologies and practices and other information that extension services promote. We must select a few topics only. We can then say that these things represent the range of issues that extension deals with. In other words, they are indicators of the bigger picture of extension work.

Therefore, each region has designed its own questionnaire to investigate selected topics, which they believe represent the many that extension in a specific region is promoting. These key

topics have been selected from amongst those the region expects to be the most important over the next few years. Specific questions have been asked to try and pinpoint whether farmers are aware of and understand extension recommendations, have reacted to and adopted them.

The hypothesis we are testing therefore is that extension services have a positive impact on farmer knowledge and behaviour. We are not able, at this stage, to test the hypothesis that this improved farmer knowledge and behaviour has in turn led to increased productivity and incomes, or improved agricultural GDP or balance of trade (purpose and goal indicators). To do so we need much better production and incomes data over a long period. Rather, we assume that, all being well in terms of the external environment, in other words when conditions allow, that improved farmer knowledge, technologies and practices will have an impact on production and incomes.

Finally, we must also acknowledge that monitoring extension impact, even at the output level, is not easy. How can we say that change in farmer behaviour is because of extension? Many variables influence farmer behaviour including information provided by other services. However, Namibia's extension services pride themselves on the extent to which they collaborate with other services (government, non-government and private), and are content to share credit should impact, in due course, be revealed.

### 2.3 QUESTIONNAIRE PROCESS

So far, we have focussed on conceptual issues. Now we move to the practical means of extension impact assessment.

Formal questionnaires are a useful tool for research into people's perceptions, levels of awareness, knowledge and practices related to specific issues under investigation. Questionnaires are essentially a mechanical tool, in which you ask carefully defined questions covering selected issues, to a carefully selected representative sample of the community, you receive answers, which are entered on answer sheets in code form, and you analyse these answers statistically.

This survey was undertaken by the regional team of the agricultural extension service, under the leadership of the regional Chief Agricultural Extension Officer, as follows.

**Table 2.3.1 MAIN STEPS IN THE BASELINE SURVEY PROCESS**

1.	Questionnaire design: this involved the elaboration of region-specific indicators used to prepare questionnaires for each region. Questionnaires were based on a common national outline relating to indicators of common concern, but incorporating local specific issues. Questionnaire design also included pre-testing in the field and subsequent modification of questions to ensure they were correctly phrased, relevant and so on. <i>(January-March 2003)</i>
2.	Planning of field implementation: sampling procedures and logistics. <i>(April 2003)</i>
3.	Field implementation: to minimize bias, extension staff took no part in interviews. Their role included: <ul style="list-style-type: none"><li>- hiring of enumerators;</li><li>- training of enumerators;</li><li>- liaising with communities;</li><li>- transporting enumerators in the field;</li><li>- field supervision of enumerator performance; and</li><li>- field checking of completed questionnaires.</li></ul> <i>(May-June 2003)</i>

4. Data analysis: data entry and analysis was done using the software package Statistical Package for the Social Sciences (SPSS) and was contracted out. *(July-September 2003)*
5. Report preparation. *(July – October 2003)*

This process is revisited in more detail in Section 5 of this report. The questionnaire is presented in Annex 1.

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## PART TWO

### 3 AGRICULTURE IN OSHIKOTO REGION

#### 3.1 BIOPHYSICAL RESOURCES

The Oshikoto region consists of a land area of 38,653 km<sup>2</sup> (3,865,300 ha) of which more than seventy percent is utilised for agricultural purposes. It is a known fact that agriculture plays a vital role in improving not only the rural livelihoods but also of those people living in urban areas. The Ministry of Agriculture, Water and Rural Development's (MAWRD) mission is to promote and facilitate environmentally sustainable development, management and utilisation of water and agricultural resources to achieve sound socio-economic development together with all citizens of this country. As far as agriculture is concerned in Oshikoto region, it is diverse.

Including, in its south, part of the Maize Triangle (Tsumeb, Grootfontien and Otavi) the Oshikoto region receives a significant amount of rainfall almost every year. The average annual rainfall varies from 550-660mm (Mendelsohn, et al. 2000) per year in the wettest areas (northeast and around Tsumeb) to below 500mm in the central and western parts of the region. Recent studies have found that most of the moist, rain-carrying air blows from the north and north-east hence causing the areas in this part of the region to receive not only the first rain but also more rainfall during the rainy seasons. This leaves less moisture to fall in areas further south and west (Mendelsohn, et al. 2000).

Soils of Oshikoto region range from deep Kalahari sands in the northeastern part (Mangetti and Okankolo areas) to Loams, Clays and Dolomite sands in the far south-eastern part (Tsumeb) of the region. Small areas of salty soils are also found in the western part of the region. However, a high degree of soil salinity is found around the Etosha Pan, which is due to constant flooding and evaporation of pans in that area.

The Oshikoto region is blessed with two seasonal rivers namely the Omuramba Oshigambo, which branches out from the Cuvelai system deriving from the Angolan highlands, and the Omuramba Owambo, which runs into the Etosha pan from the eastern part of the region. Underground water plays a crucial role in sustaining life in this region. People in this region depend primarily on underground water due to absence of perennial rivers and water dams etc. However, some communities closer to the main road to the north of the Veterinary Cordon Fence (VCF) obtain their water from water pipelines that come from the Ruacana dam on the Kunene River. Although it is regarded as the region with the lowest levels of saline soil, many of the earth dams as well as groundwater wells that are hand dug by farmers in remote areas contain very saline water. Some of them are so salty that even the animals can refuse to drink.

Being the region that receives the most rainfall and with greatest variety of soils types compared to other regions in the north central, the Oshikoto region has diverse vegetation. In the far eastern and southern part (the Karstveld area), the region is dominated by woody plants and shrubs i.e. *Acacia* species, *Catophractes alexandri*, *Terminalia prunioides* and *Combretum apiculatum* and *Colophospermum mopane* trees and shrubs etc (Mendelsohn, et al. 2000). In fact, these areas suffer from considerable bush encroachment. *Terminalia sericea* trees and shrubs with isolated patches of tall, dense *Terminalia prunioides* woodland mainly dominate the northeastern part of the region. Other shrubs species such *Grewia bicolor*, *Croton menyhartii* etc are not abundant. The ground cover is primarily dominated by annual grass species such as *Melinis repens*, *Urocloa brachyura*, *Aristida stipitata* and

*Pogonathria fleckii*. Perennial grasses such as *Eragrostis palens*, *Schmidtia pappophoroides* and *Stipagrostis uniplumis* are also found in undisturbed soils.

### 3.2 POPULATION ISSUES

With a population of 161,007 (Central Bureau of Statistics [CBS], 2001) or approximately 9% of the total population of the country, 91% of the population live in the rural areas while only 9% live in urban areas (mainly in Tsumeb). According to the CBS (2001), this region was found to have the third highest average household size of 5.6. The Okavango and Omusati region were the highest with average household sizes of 6.5 and 5.9 respectively in the whole country.

Oshikoto region is known for its abundant natural resources and high potential for agriculture. However, agriculture is one of the sectors heavily affected by HIV/AIDS, and the Oshikoto region is not an exception. The agricultural labour force, which consists of mostly the economically productive members of the society (16-49 years), is the most affected by this killer disease. Instead of diversifying the agricultural sector as much as possible in the region the available labour concentrates on food self-sufficiency due to the pandemic, and increases their demand on labour saving technologies such as planters and inter-row weederers.

### 3.3 LIVELIHOOD PATTERNS

In the Oshikoto Region, much of the land surface is owned by the State, followed by private individuals/companies and then local authorities. Although there are several resettlement farms in areas south of the VCF within the region, the commercial farms dominate the farming enterprise. There are over 200 commercial farms including the Affirmative Action Farms (AAF) in this region. Carrying capacity in these farms varies according to the soil type and degrees of bush encroachment.

Farming is the main activity on most communal lands of Oshikoto in the form of small-scale agriculture. Traditionally, significant numbers of communal households in the region are transhumant pastoralists, whose subsistence strategy is based around two principal activities namely livestock farming supported by migratory seasonal grazing and rain fed agriculture. However, this system [transhumant pastoralism] is being threatened by prevailing changes in the surrounding ecosystem, and by both sociological and political economy of the region. As a result the very basis of this form of rural livelihood is altering.

In the Regional Development Plan of Oshikoto Region, the Namibia Development Consultants [s.a.] stated that communal area agricultural production is below average as a result of several factors such as urban migration, lack of technological development, persistent increasing human population, depletion of natural resources and, most importantly, poverty. However, as in other NCA, the Oshikoto rural households have developed multiple income strategies in their efforts to minimise the risks of an uncertain climate and the vagaries of a declining physical resources base. Income derived from agricultural produce is being replaced by income from remittances, pension and from wage salaries earned by family members working in towns. In general the wealth of rural households in Oshikoto region is mainly dependent on the above mentioned non-agricultural income sources. More people rely on purchased food using incomes derived from employment, pension, remittances of both food and cash and a range of non-farm activities including trading (Namibia Development Consultants, [s.a.]).

On communal land, private individuals control large areas of farmland. These farmlands were established in three ways. Firstly, 106 farms in Mangetti block were allocated or leased to individual farmers by the previous government during the 1970s. Secondly, the traditional councils allocated farms to individuals. Lastly, some private individuals also acquired many large farms on communal areas through “illegal fencing”, which in turn limits open access to grazing, water and other natural resources in communal areas (Mendelsohn et al., 2002).

The Mangetti farms, consisting of a block of 106 individually fenced farms between 1,100 and 1,300 hectares in extent, are leased to farmers on a long-term basis. Each farm supposed to support a maximum of 120 cattle, was leased for N\$700 to N\$800 per year in 1999 (Mendelsohn et al., 2002). Mendelsohn et al. (2002) concludes that these are modest costs since many of the tenant farmers are extremely wealthy people and MAWRD maintains the boreholes and pumps that provide water at no cost to the farmer<sup>1</sup> (Mendelsohn et al., 2000).

### 3.4 LIVESTOCK PRODUCTION

Farming in Oshikoto region is mainly dominated by cattle and goat farming, with large numbers of animals found in the communal areas to the north of the VCF. Despite a large number of animals in these areas, the off-take is extremely low due in part to the high marketing costs involved, particularly the costs associated with prolonged quarantining and transportation costs. The main cattle breeds in Oshikoto Region are the indigenous Sanga/Nguni and their crosses with Brahman, Bonsmara, Afrikander and Simmentaler. Cattle in particular are principally important as a mark of status in many communities of Oshikoto region, more particular the male population. Cattle have other important assets as income generators to pay for school fees and clothes. Cattle provide for crop production with draught, as well as their manure from kraals used to fertilise the fields. Livestock are moved into kraal during the wet and dry seasons to collect manure and for convenience for movement to eater points.

While animals are in the kraal stalks from crop production are fed as fodder during the dry season. Supplementary feeding is given to preferential cattle used for their draught power, when the ploughing season begins in December. Other forms of fodder include traditional herbs, though, these herbs are primarily used as medicinal cures for sick animals.

Management of livestock is done by adults in the morning, while children herd the stock after their school hours. Significant animal diseases in Oshikoto include Anthrax, Lung sickness, Anaplasmosis, Blackquarter and Foot and Mouth Diseases. Drugs supplies are available from pharmacy for livestock in Ondangwa or else at Onankali ARDC.

There are basically two movements of cattle that occur in NCA (North Central Areas) including Oshikoto Region. The first movement is usually towards the end of summer (between March and May) when cattle are brought home to the densely populated areas where many families lives permanently (Mendelsohn et al., 2000). During this time, the animals enjoy the green new pastures that have grown during the rainy season and also feed on crop residues left in the fields. The second movement of animal back to the cattle posts occurs once all the grazing is depleted and it is usually between August and October. By way of contrast, more and more livestock owners tend to keep most of their livestock permanently at the posts and move only fewer animals when necessary.

Unlike other regions, the movement of animals in Oshikoto Region is only restricted to certain areas due to large area of land that is fenced, viz. Mangetti ranches, commercial and resettlement areas and the VCF. In addition, the limitation of water points restricts movement of animals to other places where grazing is available. But, with the installation of pipelines and construction of water points, herders tend to move their animals to pasture further away than before.

Estimates of livestock numbers in the four north central regions, taken from four Agricultural Censuses in the late 1990s, are given in Table 2, below.

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<sup>1</sup> This service includes maintaining boreholes, repairing diesel pumps and supplying fuel. Now MAWRD stopped supplying fuel to these farmers in August 2002, and the other two services will be stopped soon.

**Table 3.4.1 Livestock population in NCD for the Agricultural Season 1996/97 to 1999/00**

Region	Season	Livestock						
		Cattle	Goats	Sheep	Pigs	Donkeys/Mules	Poultry	Horses
Oshikoto	1996/97	116,188	181,438	15,118	7,383	20,081	157,161	387
	1997/98	113,428	215,961	361	10,850	19,926	190,665	222
	1998/99	123,959	213,960	813	12,572	18,859	166,731	215
	1999/00	111,576	202,405	1,334	12,657	17,420	160,548	188
Ohangwena	1996/97	198,920	374,690	2,293	14,671	15,686	214,431	1,531
	1997/98	161,283	341,074	1,017	20,125	22,601	243,455	1,219
	1998/99	231,756	348,763	8,107	26,358	20,990	268,017	841
	1999/00	205,237	285,789	451	21,932	26,601	225,851	640
Oshana	1996/97	51,258	129,399	4,762	11,357	11,957	109,421	0
	1997/98	58,634	149,322	2,176	13,257	10,984	161,579	246
	1998/99	104,222	242,223	5,055	18,019	16,115	193,250	0
	1999/00	75,447	198,442	6,485	17,899	14,996	142,288	868
Omusati	1996/97	113,819	265,587	16,753	18,172	35,851	179,636	92
	1997/98	164,199	283,164	21,315	20,890	58,213	228,278	442
	1998/99	225,610	328,577	23,172	24,494	51,059	222,376	1,611
	1999/00	156,827	298,529	20,897	20,795	31,605	199,686	1,246

Source: CBS, 2001

### 3.5 CROP PRODUCTION

Despite the frequent insufficient and erratic rainfall and the poor soil types, crop farming plays a significant role in the farming sector of Oshikoto region. It is important to every rural community in this region. Whereas many farmers to the north of the VCF frequently cultivate pearl millet and sorghum, farmers to the south of the VCF mainly produce maize on a large scale. These crops are grown on dryland fields where they depend on rainfall for moisture. Like in other regions of NCD, most farmers have only one (at least 2 ha) field in Oshikoto region (Mendelsohn et al., 2000). However, wealthy farmers with oxen have larger field crop [4 ha] but the differences do not indicate any commercial gain through crop farming. In 1999/2000 total area planted to dry-land crops was 53,598 hectares in 15,651 fields (CBS, 2001). This represents an average field size of 3.42 hectares per agricultural household where crops are intercropped in most cases. Yet production per capita is insignificant, particularly in the communal areas.

In communal areas, the harvests may be consumed at home or sold at local market. Moreover, some harvest in good years will be stored for possible use in years when food is in short supply. In contrast, irrigation potential deriving from significant ground water reserves in the Tsumeb district allows for some commercial horticultural production i.e. cabbage, tomatoes, potatoes etc. The table below indicate the areas cleared for crops cultivation up to the year 2000.

**Table 3.5.1 Areas cleared for cultivation in NCD in 2000**

Region	Area cleared for crops (km <sup>2</sup> )
Oshikoto	3,910
Ohangwena	3,250
Oshana	1,880
Omusati	5,630

Source: Mendelsohn et al., 2002

It is worth noting that areas cleared for cultivation consist of those areas that were planted during 1999/2000 agricultural season, those that could not be planted (because of inadequate rains or shortage of seeds) and those that have been abandoned or perhaps cleared but never used. Recent crop production data is presented in the table below.

Table 4 indicates the estimated total area cultivated mainly to small grains over the last eight seasons in the four north central regions, as well as average annual yields, and consequently total harvests.

**Table 3.5.2 Millet & Sorghum Grain Production (in Metric Ton) in NCD**

Region	Production Season	Area Planted ('000 ha)	kg/ha	Yield ('000 mt)
Oshikoto	1994/95	65.0	100	6.5
	1995/96	65.0	100	6.5
	1996/97	66.0	380	25.1
	1997/98	52.8	170	9.0
	1998/99	56.1	150	8.4
	1999/00	61.2	400	24.5
	2000/01	58.1	296	17.2
	2001/02	50.0	160	8.0
	2002/03	62.7	240	15.0
Oshana	1994/95	85.0	175	14.9
	1995/96	89.0	235	20.9
	1996/97	89.7	350	31.4
	1997/98	85.0	150	12.7
	1998/99	85.2	190	16.2
	1999/00	75.3	312	23.5
	2000/01	71.5	250	17.9
	2001/02	60.5	160	9.7
	2002/03	84.4	250	21.1
Oshana	1994/95	35.0	120	4.2
	1995/96	35.0	185	6.5
	1996/97	39.0	330	12.9
	1997/98	31.2	150	4.7
	1998/99	37.1	160	5.9
	1999/00	41.0	284	11.6
	2000/01	36.9	255	9.4
	2001/02	31.5	150	4.7
	2002/03	32.0	170	5.4
Omusati	1994/95	90.0	90	8.1
	1995/96	72.0	250	18.0
	1996/97	91.8	350	32.1
	1997/98	64.3	140	9.0
	1998/99	64.2	150	9.6
	1999/00	78.0	185	14.4
	2000/01	70.3	295	20.7
	2001/02	60.0	140	8.4
	2002/03	73.4	170	12.5

Source: Namibia Early Warning and Food Information Unit, 2003

Agricultural extension officials estimated these figures following field observation during the production season. The great variation from season to season, due primarily to rainfall variation as noted above, is very noticeable. Apart from crop cultivation, commercial farmers in Tsumeb district also produce fruits such as oranges, mangoes, litchi and avocados to mention a few.

### 3.6 FOOD SECURITY

Although it is common knowledge that drought is frequent in Namibia, the Oshikoto region population copes much better to a certain extent than some other regions. This is partly due to the limited importance of crop production as a source of income and partly due to traditional crop surplus storage practices. However, food security is one of the major problems particularly in the rural communities.

In the Regional Development Plan of Oshikoto Region, the Namibia Development Consultants [s.a.] stated that 27% of all children under the age of five are stunted and suffer from chronic under nutrition and some 10% suffer from moderate to severe wasting. It was found that in 1993/94, 9% of the region's households were regarded as extremely poor, spending more than 80% of their income that they do not necessarily get from agricultural produce on food (Central Statistics Office, 1996)

## 4 AGRICULTURAL EXTENSION SERVICES IN OSHIKOTO REGION

### 4.1 MISSION AND STRATEGY

The Directorate of Extension and Engineering Services (DEES), within the Ministry of Agriculture, Water and Rural Development, exists to promote the adoption of improved agricultural technologies, farming practices, and farmer organisation in order to increase agricultural production, empower farmers and facilitate sustainable improvement in living conditions of the rural communities. In addition, the DEES is responsible for the management of national extension programmes that include the functions of planning, implementing, monitoring, evaluating and re-planning activities to meet objectives determined by government policy.

In 2002 the Directorate adopted a logical framework [logframe], which is a tool that links long term policies and plans (e.g. Second National Development Plan [NDP2]) with short-term plans (e.g. Annual Work Plan and Budgets). This tool also helps the ministry to carry out all its duties more effectively and be able to monitor and evaluate. Using the logframe the Directorate has set out its goal and purpose, and defined the outputs as well as the main activities that have to be carried out to achieve the set objectives of the Ministry at large. The core of this Logframe is reproduced in the table below.

**Table 4.1.1 Extension logical framework**

<b>GOAL</b>	
<b>Improve food security at household and national levels</b>	
(It should be noted that food security is not the same as food self-sufficiency. Food security refers to the ability to secure enough food, whether it is produced or purchased using income from other sources, while food self sufficiency refers to the ability to produce enough food.)	
<b>PURPOSE</b>	
Farmers have achieved increased and sustainable agricultural production and increased incomes deriving from agriculture.	
<b>OUTPUTS</b>	<b>ACTIVITIES</b>
1. Improved agricultural technology and practice options are available to stakeholders	<ul style="list-style-type: none"> <li>❖ Development of relevant agricultural technology</li> <li>❖ Development of information on relevant agricultural technologies</li> <li>❖ Dissemination of information on relevant agricultural technologies to create awareness and interest.</li> </ul>
2. Relevant farmer support information is available	<ul style="list-style-type: none"> <li>❖ Inform farmers on agriculture-related policy issues, input and product markets, and complementary service provision and on related value added opportunities, and complementary off-farm livelihood opportunities</li> </ul>
3. Human resources in the agricultural sector are developed	<ul style="list-style-type: none"> <li>❖ Farmer training in technical, management and facilitation skills</li> <li>❖ Staff of DEES and partners training in technical, management and facilitation skills</li> </ul>

<p>4. Agricultural institutions and organisations are strengthened towards improved service delivery</p>	<ul style="list-style-type: none"> <li>❖ Facilitate CBO formation, provide training in technical and management skills and support CBO projects</li> <li>❖ Management information systems</li> <li>❖ Efficient use of personnel, financial, logistical, infrastructure and material resources</li> </ul>
<p>5. Co-operation between partner organisations is improved</p>	<ul style="list-style-type: none"> <li>❖ Information sharing (documents and meetings), joint planning and co-ordinations, joint-planning and collaboration</li> </ul>

#### 4.2 KEY EXTENSION APPROACHES

To reach out to and deliver prompt services to its clientele the DEES uses a variety of strategies. For example, it seeks to work with FED (Farmer and Extension Development) groups and Farmer Associations as well as individuals, it conducts visits and discussions, it provides short course and informal training, and works with farmers to establish on-farm demonstrations of innovations. The Farming System Research & Extension (FSR&E) approach steer our strategies to development. The approach was adopted by the Ministry in 1995 and implemented in 1997. The approach consists of general principles used in research and extension. It offers tools and guidelines for research and extension to achieve the Ministry's policy objectives. The key characteristics of the approach are:

- **Participatory:** Refers to action participation of farmers and developmental agents before, during and after all development prospects are implemented for empowering the communities.
- **Demand driven:** Although the Ministry recognise the three types of demand namely, (a) Demand deriving from international conventions and commitments, (b) Demand deriving from national level and (c) Demand emanating from farmer participatory interactions; the latter remains our priority in Oshikoto region.
- **Multidisciplinary:** Refers to bringing pools of knowledge together. With the prevailing shortage of well-qualified staff in the region in all fields of studies, we intend to network with other regions, sister directorates and line Ministries, in order to reach out to all our farmers' demand.

To effectively follow the concept of this approach, we follow its cycle, which is indicated in the table on the next page.

**Table 4.2.1: The FSRE approach to the project cycle**

<b>CYCLE PHASES</b>	<b>WHAT?</b>	<b>WHO?</b>	<b>OUTPUTS</b>
<b>Analysis and diagnosis</b>	Primarily an investigating and analysing activity with farmers to understand how their systems are organised to ensure that projects and programmes respond to real needs (using tools such as PRA, PLA).	This is a participatory activity. A Multi-disciplinary team approach is ideal with relevant subject matter specialists interacting with community members. Ideally, this could involve staff from throughout the Ministry – DEES, DART, DVS, DRWS, other stakeholders (Ministries, CBOs NGOs) <b>and farmers/community members</b>	Identification and classification of main farming systems or livelihood systems and descriptions of key system constraints and potential opportunities.
<b>Activity planning to address constraints and opportunities</b>	Primarily a <b>development planning</b> activity.	Involvement in this activity depends on the nature of the constraint/opportunity being addressed. This is likely to fall under either: <ul style="list-style-type: none"> <li>• Production systems (may require - participatory technology development, adaptive research, training etc)</li> <li>• Marketing systems (infrastructure, training, market information etc)</li> <li>• Community organisation (CBO formation, training, etc.)</li> <li>• Enabling environment etc. (Policy changes, infrastructure, legal reform)</li> </ul> <b>All of these will involve farmers/community members and Extension with other development professionals involved as required by the programme</b>	Implementable Programmes/ Projects These may be designed to be led by CBOs, NGOs and Directorates etc, depending on the nature of the activity that has emerged from the analysis and planning process.
<b>Programme / Project implementation</b>	This may be a variety/ combination of activity types; research, extension, training, communication/ information.	May involve Ministry staff from number of Directorates/ other Ministries and stakeholders <b>But again it will always involve farmers/community members and Extension</b>	Whatever the programme or project aimed at. For example, increased productivity of systems, improved incomes, reduced risks, reduced vulnerability, improved household and National food security, increased human resource and/or institutional capacity in rural communities
<b>Review, monitoring and evaluation, impact assessment</b>	This is primarily a <b>research</b> activity	All involved in implementation of a programme or project should participate e.g., subject matter specialists and staff from throughout the Ministry – Research, Extension, Vets, Water and possibly other stakeholders (Ministries, NGOs) <b>and farmers/community members.</b>	Quantification of progress, adjustment of activities, new activities, re-prioritisation.

Moreover, there are over sixty FED groups in Oshikoto region and the main aim of promoting their formation is to create a platform where both farmers and extension agents can meet more easily to share and discuss rural community developmental issues. The groups also carry out trials on new technologies and practices collectively i.e. improved crop varieties and Cotton etc. FED groups may consist of as many as twelve different village communities or as few as one community. Although the Ministry is faced with limited resources, individual visits can be made to specific target groups such as resettlement farmers and other vulnerable groups to assist them where necessary.

Besides the FED groups, farmers are also encouraged to form farmers' associations and/or co-operatives. This is to improve the interactions among themselves and be able to steer developments in their community. In addition, they are motivated to form these associations in order to make it easier for them to solicit funds, or any other assistance from developmental, and service agencies. In the Oshikoto region, there is one well-established farmers' association and one agricultural co-operative viz. the Mangetti Farmers' Association and Uukumwe Farmers' Cooperative, based in Eengodi and Onayena constituencies respectively.

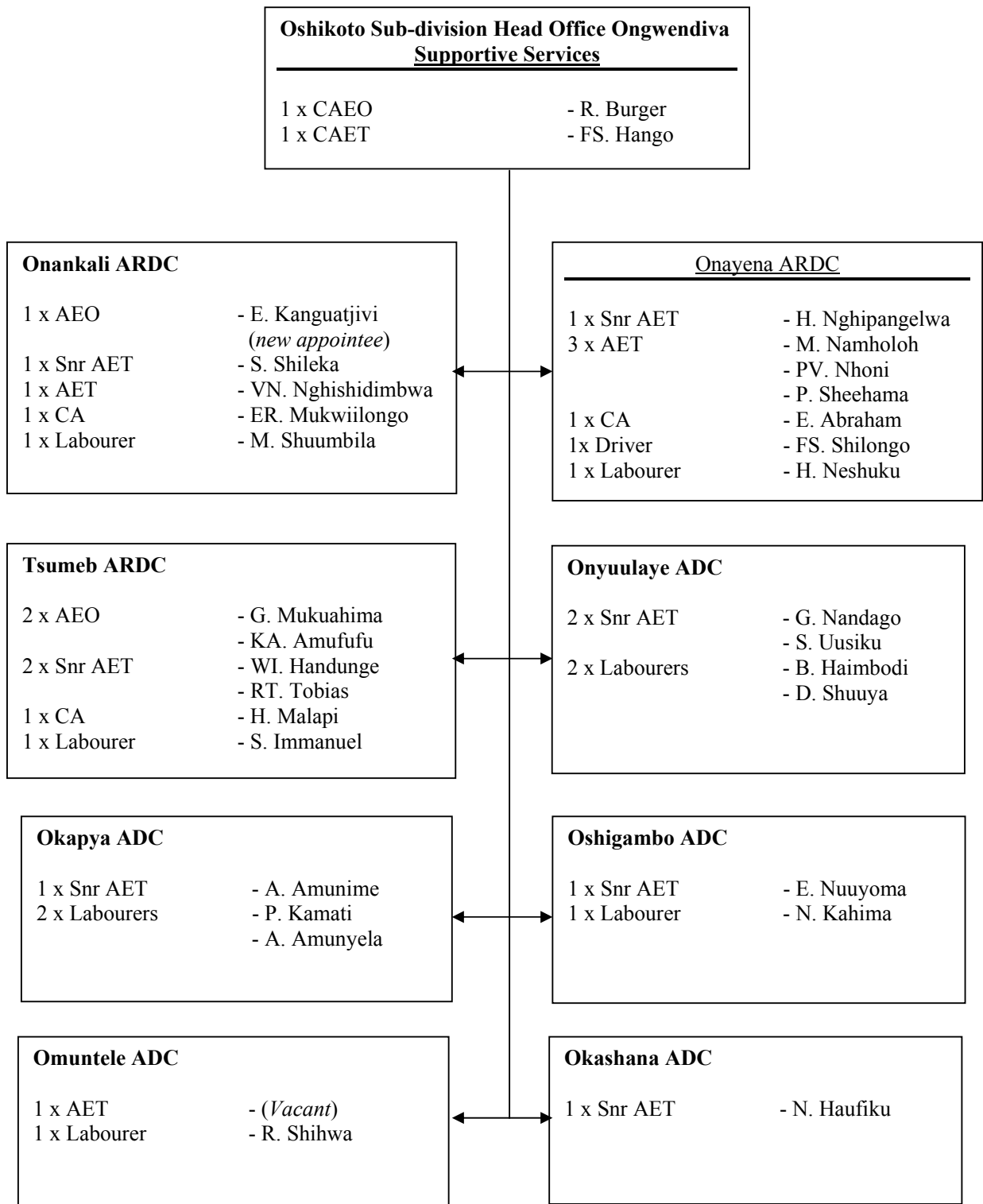
Furthermore, the Directorate also conducts training courses and on-farm demonstrations on various agricultural aspects. For example to equip farmers with all the relevant skill/knowledge, courses are taught in the field of crop production, animal husbandry, managerial skills, formulation of project proposal and community project management.

Regarding agricultural communications, various mass communication equipment and software are utilised and combined with various tools of the mass media channels, such as TV, radio, newsletter, and magazine, so that agricultural news and information can be easily disseminated to farmers. There are two mass media specialists responsible for these activities in the region, and they work in collaboration with four other specialists from the NCD mass media team.

#### 4.3 DEES POST ESTABLISHMENT IN THE REGION

In Oshikoto region, the DEES have thirteen dedicated and hard working Agricultural Extension Technicians (AETs). All are National Agricultural Diploma holders and are mainly specialised in the field of crop production. Over 60% of them are Senior Technicians. With the recently appointed Agricultural Extension Officers (AEO), the region now has three AEOs who are all degree holders, specialised in animal science. Furthermore, the region also has a well-qualified Chief Agricultural Extension Officer (CAEO) and a Chief Agricultural Extension Technician (CAET), specialising in animal nutrition and extension management respectively. However, considering the farmers' population in this region and the total land area, the Oshikoto sub-division is still under-staffed particularly regarding AETs. See the table on the next page.

**Table 4.3.1 Staff of Oshikoto region sub-division**



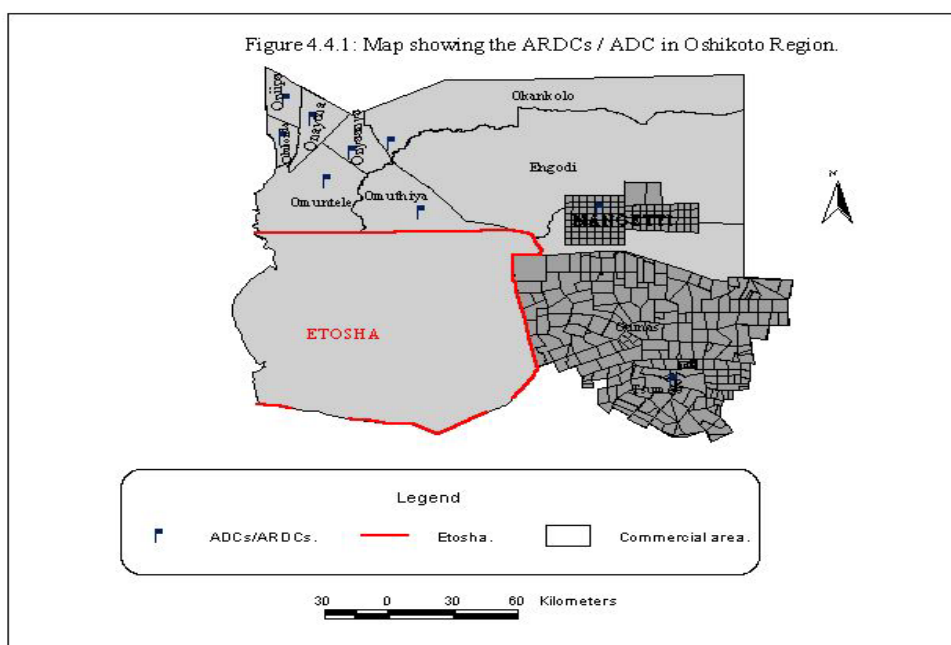
At the moment, the ratio of farmers to AETs is very high by national and international standards. Each AET in the region is currently faced with having to work with approximately 1,869<sup>1</sup> farm households.

#### 4.4 ADC<sup>2</sup>

There are 9 Agricultural Development Centres (ADCs) in Oshikoto region and these centres are located in almost all of the constituencies (see Figure 1).

**Table 4.4.1 ADCs in Oshikoto Region**

ADC	Constituency
1. Tsumeb ADC	Tsumeb
2. Okashana ADC	Omuthiya-gwiipundi
3. Okapya ADC	Guinas
4. Onankali ADC	Onyaanya
5. Onyuulae ADC	Okankolo
6. Onayena ADC	Onayena
7. Olukonda ADC	Olukonda
8. Oshigambo ADC	Oniipa
9. Omuntele ADC	Omuntele



<sup>1</sup> Total number of communal farming households = Regional population (161,007) divided by the average household size (5.6) multiplied by percentage of rural population (91). At the time of reporting there are 14 AETs and 3 AEOs working directly with these farmers. This gives extension worker to farmer ratio of 1,869.

<sup>2</sup> The phrases Agricultural Development Centre (ADC) and Agricultural Rural Development Centre have been used interchangeably, and they all refer the offices where agricultural extension workers are operating.

## 4.5 OPERATIONAL EQUIPMENT

Among the four north-central regions, the Oshikoto region sub-division is perhaps the most under-equipped in terms of computers and audio-visual facilities. Out of the nine ADCs in the region only three ADCs are equipped with computers. All centres in the region are sharing a camera and two TV sets. All centres, except Okapyia ADC, are connected to telephone lines.

With regard to vehicles, most of the staff in this sub-division has been allocated field vehicles to travel with and to use for conducting their fieldwork. See table below for vehicles and other operational equipment of Oshikoto region sub-division.

**Table 4.5.1 Operational Equipment**

### A. Vehicles

1. Single Cabs (4x4)		
	Isuzu	GRN 10273
	Isuzu	GRN 10274
	Isuzu	GRN 10276
	Isuzu	GRN 10284
	Toyota Hilux	GRN 10690
	Toyota Hilux	GRN 12448
	Toyota Hilux	GRN 12458
	Land Rover	GRN 12300
	Land Rover	GRN 12301 <i>(Garage)</i>
	Nissan	GRN 11530 <i>(Garage)</i>
	Nissan	GRN 12586
	Nissan	GRN 10912 <i>(Written-off)</i>
2. Double Cabs (4x4)		
	Mitsubishi	GRN 12484
	Colt	GRN 12611
	Nissan	GRN 10356

### B. Computers and Audio Visuals equipment

	<b>Quantity</b>
1. Computer sets	
Onankali ADC (monitor + CPU and printer)	<u>1</u>
Tsumeb ADC (monitor + CPU and printer)	<u>1</u>
Onayena ADC (monitor + CPU)	<u>1</u>
2. Television and VCR sets	<u>2</u>
3. Flip chart stands	<u>13</u>
One at each centre and 5 more at the head office	
4. Slides projector	<u>2</u>
5. Overhead projector	<u>2</u>
6. Cameras (analog)	<u>1</u>

#### 4.6 ANNUAL BUDGET BY MAIN MOF VOTE

**Table 4.6.1 Budget Allocation (in Namibian Dollars) for the North Central Division 2003-2004**

<b>Vote</b>	<b>Ongwediva</b>	<b>Oshana/Oshikoto</b>	<b>Ohangwena</b>	<b>Omusati</b>	<b>Total</b>
<b>021</b>	101,915.50	142,681.70	81,532.40	81,532.40	<b>407,662.00</b>
<b>022</b>	84,700.00	118,580.00	67,760.00	67,760.00	<b>338,800.00</b>
<b>023</b>	655,950.00	918,330.00	524,760.00	524,760.00	<b>2,623,800.00</b>
<b>024</b>	79,922.75	111,891.85	63,938.20	63,938.20	<b>319,691.00</b>
<b>025</b>	30,506.50	42,709.10	24,405.20	24,405.20	<b>122,026.00</b>
<b>027</b>	50,978.00	71,369.20	40,782.40	40,782.40	<b>203,912.00</b>
<b>041</b>	5,000.00	-	-	-	<b>5,000.00</b>
<b>042</b>	-	-	-	-	-
<b>044</b>	-	275,000.00	137,500.00	137,500.00	<b>550,000.00</b>
<b>101</b>	24,250.00	33,950.00	19,400.00	19,400.00	<b>97,000.00</b>
<b>103</b>	22,587.50	31,622.50	18,070.00	18,070.00	<b>90,350.00</b>
<b>001 A</b>	74,013.75	103,619.25	59,211.00	59,211.00	<b>296,055.00</b>
<b>003 B</b>	17,085.00	23,919.00	13,668.00	13,668.00	<b>68,340.00</b>
<b>Total</b>	<b>1,146,909.00</b>	<b>1,873,672.60</b>	<b>1,051,027.20</b>	<b>1,051,027.20</b>	<b>5,122,636.00</b>

Note: The budget allocation for Oshana and Oshikoto regions is combined due to the fact that, the two regions are being managed by one CAEO. Each of the two regions receive half of the combined budget allocation.

#### 4.7 DONOR PROJECTS

Since the mid-1990s the DEES has collaborated with a number of donor-supported projects in the Oshikoto region. Main donors have included the EU (RDSP and REMP), IFAD (NOLIDEP), French Cooperation (NNRDP, NOREESP) and Danish Church Aid. All donor-supported projects are due to phase out in 2004 with the exception of the new EU supported NASSP. (See list of Acronyms)

#### 4.8 MAIN COLLABORATORS

The Directorate in Oshikoto region fully collaborates with its sister Directorates in the MAWRD viz. the Directorate of Veterinary Services (DVS), the Directorate of Rural Water Supply (DRWS) and the Directorate of Agricultural Training and Research (DART). Regular consultations and collaborations with other developmental partners in the region such as the Regional Council, line ministries and non-governmental organisations (NGOs) is a common practice.

The Directorate shares some of its Agricultural Development Centres with DVS, DRWS and DART. The four directorates work actively together to improve the living standards of the regional communities through collective training, conducting of meetings, on-farm trails and demonstrations, and other necessary assistance. In addition, not only does the DEES share its offices with the above-mentioned Directorates, but it also shares other infrastructures such as conference rooms and auction pens during farmers training, and research stations during farmers' exposure visits and warehouses. Even our head office is in Ongwediva (Oshana region) due to lack of office space. DEES is also involved in a number of programs with other ministries like the HIV/AIDS awareness program and the provision of drought relief to mention a few.

## 5 SURVEY METHOD

### 5.1 RATIONALE

A baseline survey is a survey or assessment done on a particular subject in an area or community and it is intended to produce information on the situation “before” a particular activity or programme. On the other hand, an impact survey is an assessment done on a particular subject in an area or community to reveal information on the situation “after” a particular activity or programme has taken place. In this case the time frame corresponds to the period of the second National Development Plan (2002-06). This baseline survey was conducted after the 2002-03 farming season; and the impact survey will take place after the 2006-07 farming season. This is the basic planning frame of the Directorate.

### 5.2 SURVEY OBJECTIVES

The main objectives of the study were to produce findings of interest to DEES managers to help them steer and plan their programmes, and also to other stakeholders to inform them of the important role that the agricultural extension services is playing. This national baseline survey looked at indicators of the impact of agricultural extension services on communal farming communities in the region.

### 5.3 QUESTIONNAIRE DEVELOPMENT

The questionnaire was structured in a way that questions that explore one topic were asked, and then questions shift to the next topic. Both factual and opinion questions were presented in a closed format.

Questionnaire pre-testing preceded the main survey. Such a pre-test was done in four villages namely Elavi, Uukango-womafuma, Omalondo and Onyati. Ten respondents with similar characteristics to those in the main survey were interviewed. These respondents were selected at random, and composed of five respondents with good access to extension services as well as five respondents with poor access to extension services.

During pre-testing, weaknesses in questions were identified. This includes the clarity and understanding of questions by respondents, inaccurate answers for possibility of prestige reasons, as well as reconfirming the relevance of questions, and data to be collected. The questionnaire was then revised one more time to incorporate the results of pre-testing.

### 5.4 SAMPLE SELECTION

To facilitate sampling two farming systems areas were broadly defined on the basis of vegetation zones and soil types in the region. It has been observed that vegetation strongly influence the decision that one will have to make when choosing the type of farming to embark upon e.g. livestock, crop or both. It is also a common knowledge that farmers tend to farm with livestock only if there is enough grazing and water for the animals and do more cropping if the land is less suitable for livestock farming. Therefore farmers living in densely populated areas will farm more with crops because of limited space for animal to graze. Likewise, farmers in savannah areas will be more interested in farming with livestock than with crop.

The eastern farming system is the forest savannah & woodland area, which is made up of Eengodi and Okankolo constituencies. There are two extension wards and about 14% of farming households in this farming system area. On the other hand, the western farming system is the mopane savannah, which is made up of Omuthiyagwiipundi, Omuntele, Onyaanya, Olukonda, Onayena, and Oniipa constituencies. There are six (6) extension wards and about 86% of farming households in this farming system area. The National Census of 2001 indicated that there are 4,553 and 18,454 households in the eastern and western farming systems, respectively.

By random sampling, Okankolo constituency in the Eastern farming system and Omuthiyagwiipundi, Oniipa and Onyaanya constituencies in the Western farming system area were selected as survey areas. These constituencies constitute half of each farming system. This gave us a sample population of 1,778 households (14%) from the eastern farming system and 10,658 households (86%) from the western farming system.

The survey was conducted in the following villages for each of the Farming system area (see Figure 5.4.1).

**Eastern Farming System**

**OKANKOLO:** Onhadi, Onalusheshete, Onimediva and Onambeke

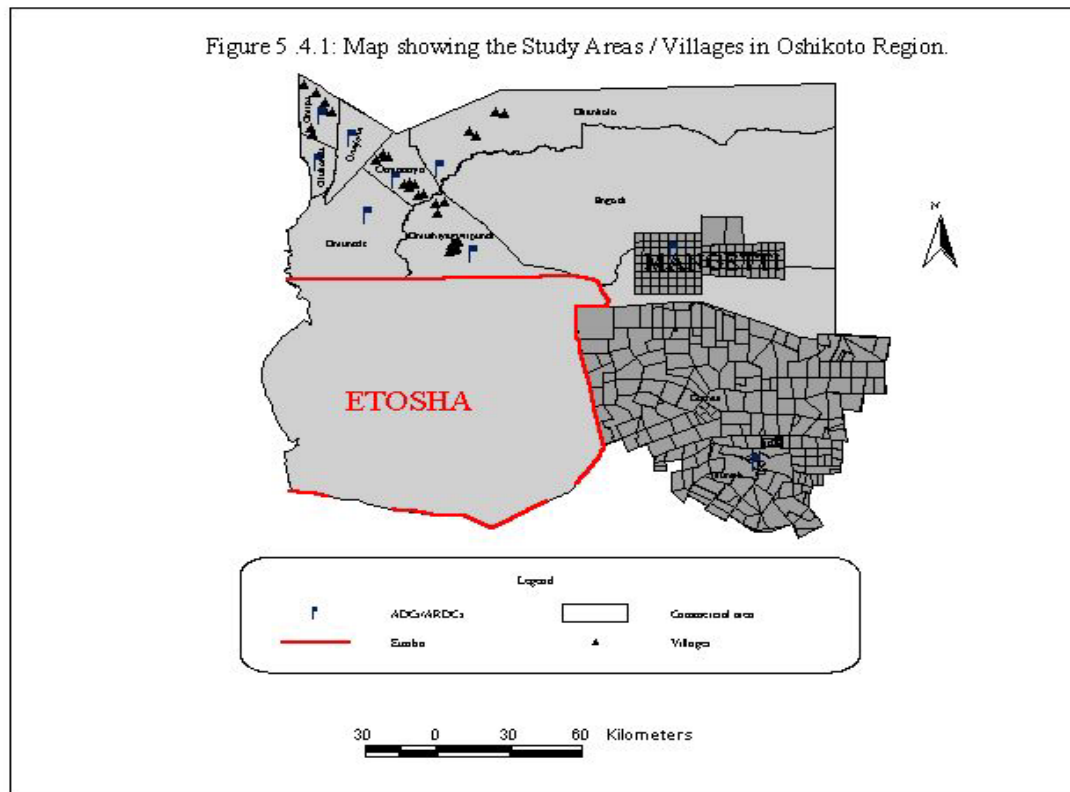
**Western Farming System**

**OMUTHIYAGWIIPUNDI:** Omainda, Onak`asino, Omuthiya A, Okankololose, Onantulo, Ehafo, Ekulo, Onambundu, Oshiyashemanya and Onuugonya

**ONYAANYA:** Etaneno, Oniitendu, Omangundu A, Omutse, Omangundu B, Okakunda, Oniiyanda, Onahenene, Onambahu and Onakalunga

**ONIIPA:** Ontanga, Onanyati, Ekamba A, Ohote, Ohainete, Onahima, Okalambo, Ondando (Epale), Oniika and Onamulunga

In the sampled villages, the questionnaire was administered to about 25 per cent of the village households by selecting every 5<sup>th</sup> household on a random walk/drive basis.



## 5.5 PREPARATION FOR FIELD IMPLEMENTATION

The Regional Governor was requested to invite potential candidates to apply for the position of enumerators. Such an invitation was aired in the NBC Oshiwambo Service Radio. The requirements were (a) National Identity document, (b) Grade 10/Std 8 with previous experience in agriculture and surveys and (c) Grade 12/Std 10 with previous experience in agriculture and/or surveys. A National Diploma in Agriculture was an added advantage.

Eight (8) candidates were interviewed for the positions of survey enumerators on the 29<sup>th</sup> April 2003 at Onankali ADC. Out of these 8 candidates, 4 were hired as enumerators for a period of 10 working days. The enumerators were then trained on issues concerning survey conduct and challenges on the 9<sup>th</sup> May 2003 at Okashana Research and Training Centre, just before the field interview began.

The Regional Governor was also requested to inform the traditional authorities and councillors, especially those serving the survey area, in order to inform the target communities to give their usual cooperation

## 5.6 QUESTIONNAIRE IMPLEMENTATION

Questionnaire implementation started on the 12<sup>th</sup> May 2003 and ended on the 22<sup>nd</sup> May 2003. On average, each interview took 25 minutes, and at least 24 questionnaires were filled each day. We aimed at completing at least 216 questionnaires but only manage to get 215 respondents. The estimation used is indicated in the formula below.

$\text{Total questionnaires} = \text{Enumerators} \times \text{Minimum questionnaire per enumerator per day} \times \text{Field days}$
--

Therefore: -

Eastern Farming System, 14% x 216 Questionnaires = **30 questionnaires**

and

Western Farming System, 86% x 216 Questionnaires = **186 questionnaires**

## 5.7 DATA ANALYSIS

Data entry and analysis was undertaken in Windhoek by contracted services. Questionnaires were inspected for errors, double responses, omissions, unanswered questions and general completeness prior to data entry, and where necessary the corrections were made. Coding of responses for some questions that were not pre-coded was done.

Trained data entry assistants transferred the data from the questionnaires into Microsoft Excel. Data analysis was done using Statistical Package for Social Sciences (SPSS) software. The data was transferred from Excel to the SPSS templates. This involved matching the cases and variables from Excel with those defined in SPSS data file. Using SPSS, the initial frequency tables covering all the defined variables per region were generated. These frequency tables were checked for errors, by inspecting values in each column against the codes for each response in the SPSS data file, and tracing the error to the specific source questionnaire. The necessary corrections were made to the data file based on information found on the questionnaire.

The corrected data set was used to generate preliminary frequency tables for all variables for the region and these tables were circulated to Region Survey Officials for review and comments during a two-day workshop. The Regional Survey Officials provided clarity on some errors in particular omissions/ unanswered questions and inconsistencies based on their knowledge of

extension in their regions. After the workshop, the comments from regional officials were used in making final corrections to the data set.

Lastly, final frequencies and cross-tabulations were established on the data, and where applicable multivariate analysis was conducted. In addition, appropriate graphics in the form of simple bar graphs, clustered bar graphs and pie charts for selected variables or survey questions were generated to complement the findings presented in the final tables.

The final tables and graphics were sent back to the regions, together with the completed questionnaires, so that report preparation could be completed.

## PART THREE

### 6 SURVEY FINDINGS

Section 6.1 – 6.3 of Part three below present the major findings of the survey in tables and/or graphs. Detailed presentation about these findings will be presented under the conclusion in section 6.4.

Out of the 215 farmers interviewed in all four constituencies, only 15 indicated that they are members of FED groups. Although more than half of the FED groups members indicated that their FED groups were active, the comparison of FED group with non-FED group was not included in the analysis because of insignificant number of FED group respondents.

#### 6.1 FARMER TYPE

As already noted in section 5, the sample of the regional population that the questionnaire was applied to was selected randomly having stratified the regional population according to certain criteria. This section of the report presents information on important characteristics indicating the types of farmers which comprise the sample. These questions are asked (i) as a check on the representativeness of the sample, and (ii) in some cases to learn more about the farmers.

The information presented below, should help us to judge the extent to which the sample was in fact representative of the entire farming community in the region. Based on our previous knowledge of farmers in the region, it can be concluded that the randomly selected sample was indeed reasonably representative. In addition, it will be important to ensure that, when the impact survey is conducted (planned for 2006/07), the sample then selected displays similar characteristics.

If it were found that the characteristics of the farmers, as sampled in either the baseline or the impact survey to follow, were significantly different from those of the community as a whole (i.e. were not representative) or from each other, this could compromise the findings of the survey related to extension - farmer contact (see 6.2) and extension impact (see 6.3). This is because responses to questions on indicators of extension – farmer contact and of extension impact may be influenced by the characteristics of the farmers, as below. For instance, if the farmers sampled all lived less than 5 kilometres from the ADC, one could say this is not representative of the whole region's population. Further, it is obvious, that one would expect this to have an influence on extension – farmer contact and impact. Likewise, to a greater or lesser extent, with all the characteristics reported on before.

#### **Distance from ADC**

**Table 6.1.1 Distance of Farmer/Respondent from ADC**

<b>Distance</b>	<b>Percentage (%)</b>
< 5Km	11.2
6-10Km	10.3
11-20Km	36.4
> 20Km	42.1

**Fig 6.1.1 Distance from ADC**

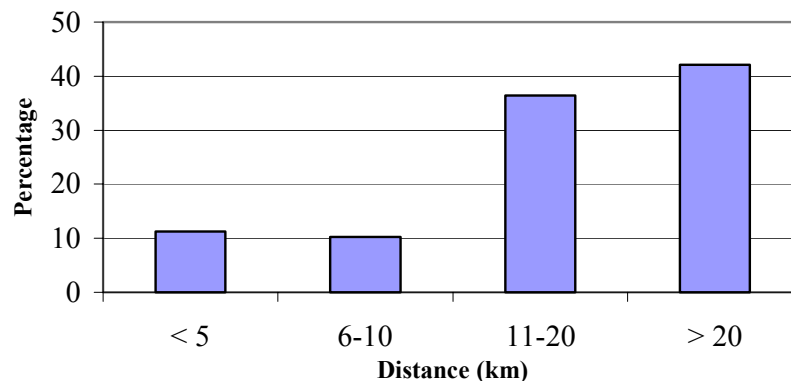


Table 6.1.1 indicates that of the total sample 11.2 % lived less than 5 km from the nearest ADC, 10.3% lived between 6 and 10 kilometers from the ADC, 36.4% lived between 10 and 20 km from the ADC and 42.1% lived more than 20 kilometers from the ADC. This distribution is reasonably representative of the all farmers in the region. The survey did not record the breakdown of those located more than 20 kilometres from the ADC, but it can be stated that great efforts were made to reach remote areas. See figure 5.4.1.

**Sex of Respondents**

**Table 6.1.2 Sex of Respondent**

Sex	Percentage (%)
Male	33.2
Female	66.8

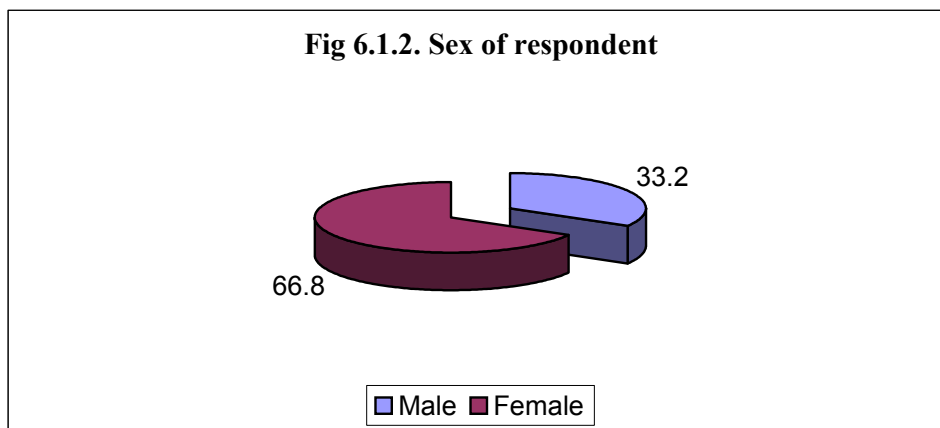


Table 6.1.2 show that about two thirds of the respondents were women. This corresponds approximately with our knowledge of the area, where we often find that men are away from home for various reasons.

## Age of Respondents

**Table 6.1.3 Age Groups**

Age group	Percentage (%)
15-30	25.7
31-45	21.5
46-60	18.2
>60	34.6

**Fig 6.1.3 Age group of respondents**

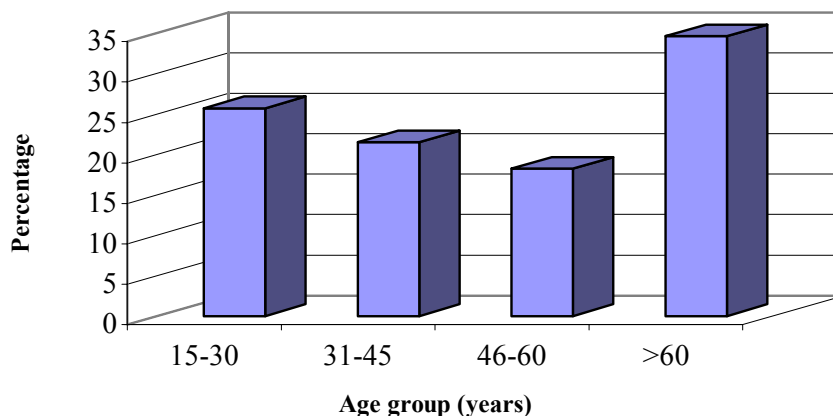


Table 6.1.3 reveals that more than one third of the sample of farmers interviewed were more than 60 years old. This could have an influence on extension impact because it is often experienced that older people are more conservative when it comes to changing their farming practices.

## Respondents as Household Head

**Table 6.1.4 Household Head**

Household head	Percentage (%)
Couple	60.7
Man	10.7
Woman	28.5

We assume that in African cultures, as elsewhere, it is more likely that the man or husband is the one heading the family household. But during pre-testing this was found not necessarily to be the case. Thereafter, the questionnaire was amended in order to accommodate the options of couple headed households. This was because we found that married couples tend to be relatively equal in making decisions in the house. Therefore, all households with married couples were considered as couple headed households, and those with single parents being recorded as either man or woman headed households.

Contrary to our expectations, more than 60% of the respondents households were headed by couples as shown Table 6.1.4 above. This is an indication that people [in particularly men] have or are gradually changing their attitudes towards accepting their female counterpart to share responsibilities within the households

## Respondent Farming Experience

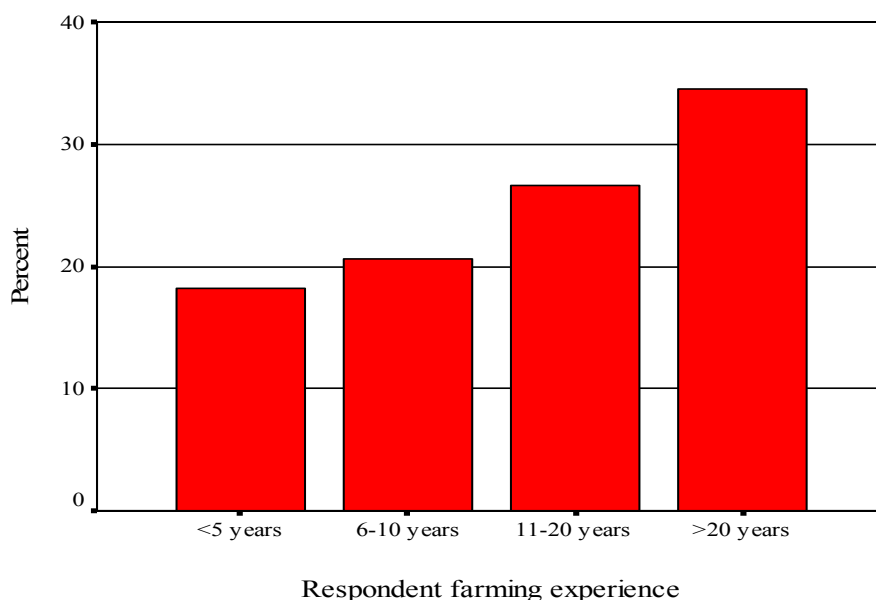
The purpose of this question was to find out the number of years that the respondents have been farming. Farming experience in this case refers to the time that one has been responsible for making the decisions on what to be done on the farm (e.g. animal grazing/movement, vaccination, castration, cultivation, marketing etc). However, the problem with this question was the wrong interpretation of enumerators, since they understood the question as how long has one been staying at the village/place where he/she is staying.

This arose because of difficulties in translating of the word “experience” in the local language. It is common knowledge that many people in the north tend to move from one place to another, and as a matter of fact many farmers from other regions have moved to Oshikoto where there is still grazing and space to settle down. Therefore, it is likely that the results presented below from this question may be unreliable due to the fact, that some of the households respondents were new in the region but not in the farming business.

**Table 6.1.5 Respondent farming experience**

Years	Frequency (%)
<5 years	18.2
6-10 years	20.6
11-20 years	26.6
>20 years	34.6

**Fig. 6.1.4 Respondents Farming Experience**



Still the figure above reveals that  $\pm$  35% of the respondents had over 20 years farming experience. Twenty years of experience may sound interesting and one would assume that adoption of new technologies to such farmers would be much easier. This could be true if the twenty years of farming was of the 21<sup>st</sup> century. Unfortunately, in Table 6.1.5, it was found that 34.6% of the respondents were over the age of sixty and one would assume that they are the one falling in the category of 20 years farming experience. This is a clear indication of how difficult the extension message may be absorbed by farmers.

## Farm Labour

It is a well-known fact that urbanization in Namibia has increased tremendously since independence, and as a result elderly people and younger children are often left at home to look after the animals and taking care of crop fields. As a result, there is a shortage of labour in many households. This situation may also impede the adoption of certain farming practices by some households due to the absence of decision-makers. The purpose of this question was to find out how many people are usually hired to help with farm work e.g. cultivation of crop fields.

**Table 6.1.6 Hired Labour**

Number of farm labours	Percentage (%)
<3	41.1
3-5	9.3
>5	19.2
None	30.4

**Fig. 6.1.5 Hired Labour**



On the other hand, Table 6.1.6, above show that this is not necessarily the case. 30% of the respondents stated that they do not seek for people to help them with the cultivation of harvesting of their fields. However, the table furthers shows that 41.1% of the respondent's seeked outside assistance but not for more than three people at a time.

## Education Levels

**Table 6.1.7 Respondent level of education**

Education level of respondent	Percentage (%)
Primary	62.6
Secondary	25.7
Tertiary	1.4
No school	10.3

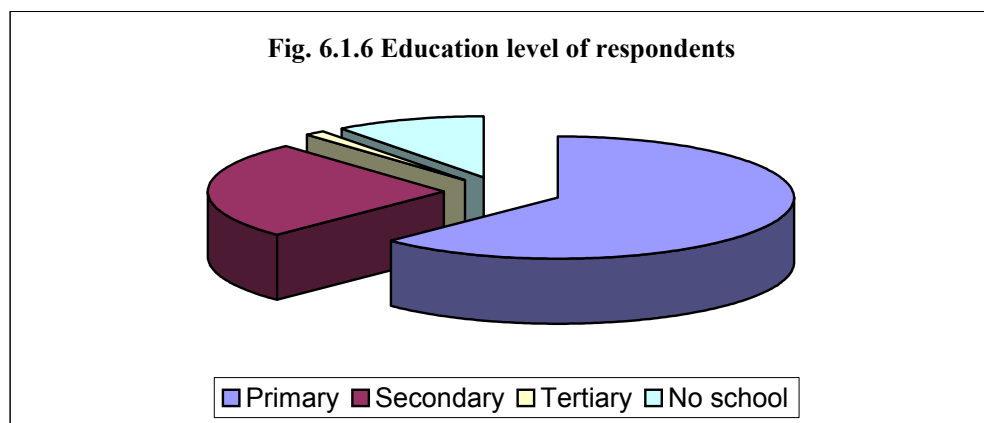


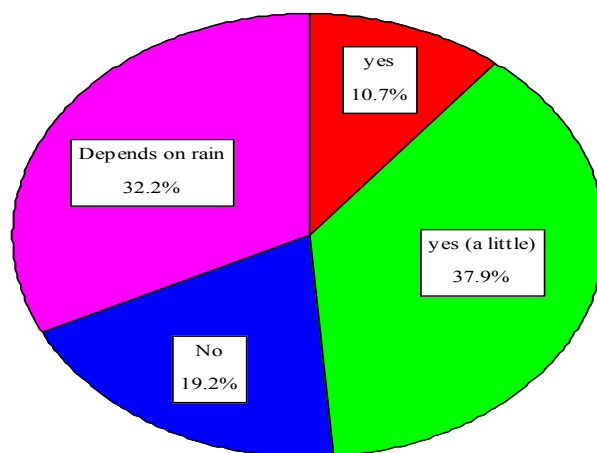
Figure 6.1.7, show that almost all farmers did go to school somewhere in their lifetime. However 2/3 of them ended at the primary school. Table 6.1.7 indicates that of all the 215 respondents interviewed during this survey only a handful went as far as Tertiary institution.

### Satisfaction

**Table 6.1.8 Basic needs satisfaction**

Farming satisfies basic needs	Percentage (%)
Yes	10.7
Yes (a little)	37.9
No	19.2
Depends on rain	32.2

**Fig 6.1.7 Basic needs satisfaction**

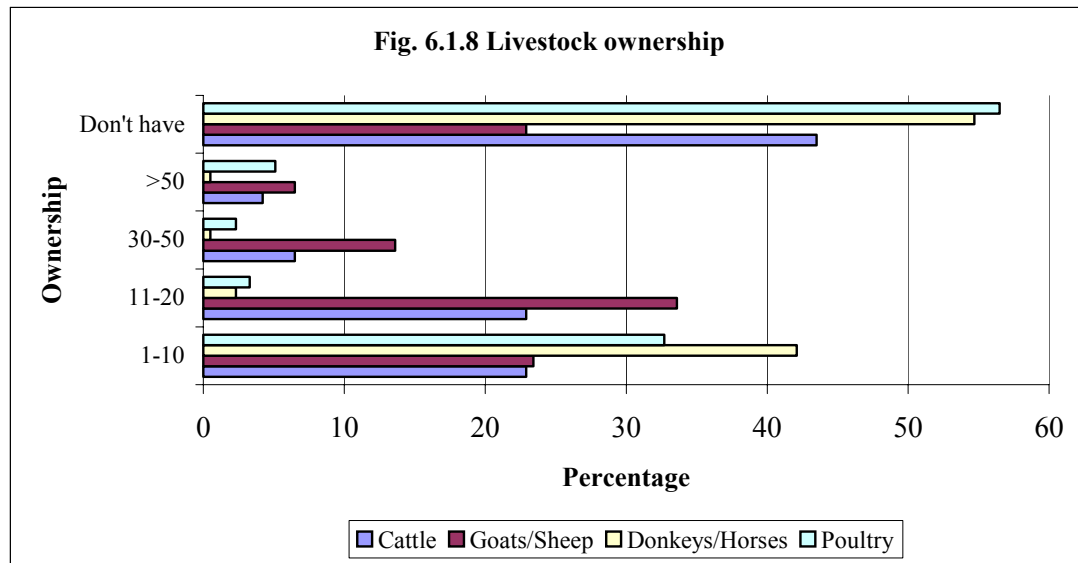


It is interesting to note that only 10.7 % of the sample stated that farming fully satisfies their basic household needs on a regular basis. Many environmental activists regard Namibia as the driest country in sub-Saharan Africa but this may not necessarily be the case by those farming in this country. 70% of this country nation directly or indirectly depends on agriculture, which in turn, fully depend on rainfall. Table 6.1.8 shows the importance of rainfall in this country by indicating that 32.2% of the sample stated that they satisfactorily obtain their basic needs from farming should there be enough rainfall.

## Livestock ownership

**Table 6.1.9 Ownership of Livestock**

Number of animals	Farmers owning livestock (%)			
	Cattle	Goats/Sheep	Donkeys/Horses	Poultry
1-10	22.9	23.4	42.1	32.7
11-30	22.9	33.6	2.3	3.3
30-50	6.5	13.6	0.5	2.3
>50	4.2	6.5	0.5	5.1
Don't have	43.5	22.9	54.7	56.5



The question of livestock ownership is widely thought to be the key indicator of wealth in rural northern Namibia. In particular it is notable that 43.5 % of households claimed they did not own any cattle. This in turn has major implications for cropping practice, as these households will be dependent on others for the hire of draught animal power for cultivation of their fields. Unless they own their own ploughing equipment, which is unlikely, this mean they will often have to wait for others to complete their cultivation and so are more likely to miss the optimal cultivation and seed sowing period. Timeous cultivation is of critical importance in crop production in the region.

## Crop Production

Originally, this question referred to the area planted during the last two seasons namely 2001/2002 and 2002/2003. But it turned out during the pre-testing that most respondents claimed not to have cultivated crops during the preceding season because of poor rainfall but only during the last one (2002/2003). As a result the question was amended to refer to the last cropping season only.

Since, it is a common knowledge that farmers do not know how big their crop fields are in terms of hectares, the enumerators were instructed how to estimate the size of cropping fields using corresponding areas such as football fields, hectares or 100 by 100 meters. However, there were

problems of enumerators not going to the crop field and measuring. Therefore, it is not clear how reliable the responses to this question might be.

In addition, respondent may not have been completely open to this question, having in mind that should they give large figures they might not benefit from the on-going drought relief programme even though they were informed beforehand that the information they will provide would be kept confidential.

**Table 6.1.10 Area Planted**

<b>Total area planted in 2002/2003</b>	<b>Percentage (%)</b>
<3	28.5
3-7	62.1
>7	7.0
None	2.3

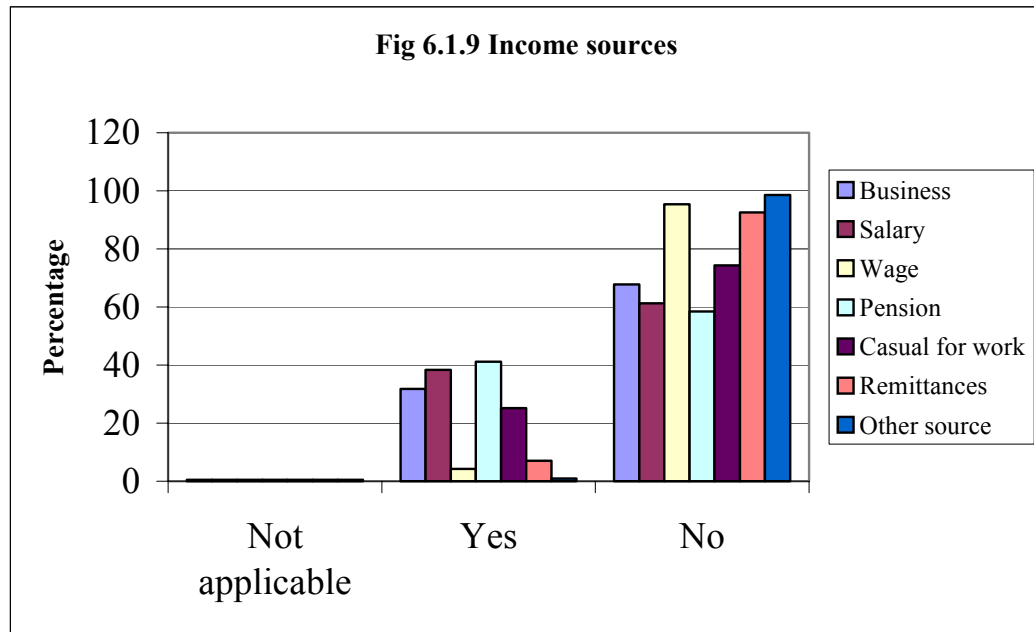
The north central regions may be regarded as the densely populated region in Namibia but this is not always the case as there is always a space for one to put his/her crop fields. The table 6.1.10 above show that 2/3 of the sample cultivated reasonable field sizes.

### **Other Income sources**

As above, this question appeared very sensitive to some respondents and as a result it is feared that some may not have responded accurately to it. Some thought that it is not a good idea to reveal all their sources of income as this might lessen their chance of getting any benefits/aid from the government.

**Table 6.1.11 Income Sources**

<b>Category</b>	<b>Type of Income Source (%)</b>						
	<b>Business</b>	<b>Salary</b>	<b>Wage</b>	<b>Pension</b>	<b>Casual work for kind</b>	<b>Remittances</b>	<b>Other source</b>
Yes	31.8	38.3	4.2	41.1	25.2	7.0	0.9
No	67.8	61.2	95.3	58.4	74.3	92.5	98.6
Not applicable	0.5	0.5	0.5	0.5	0.5	0.5	0.5



## 6.2 FARMER EXTENSION CONTACT

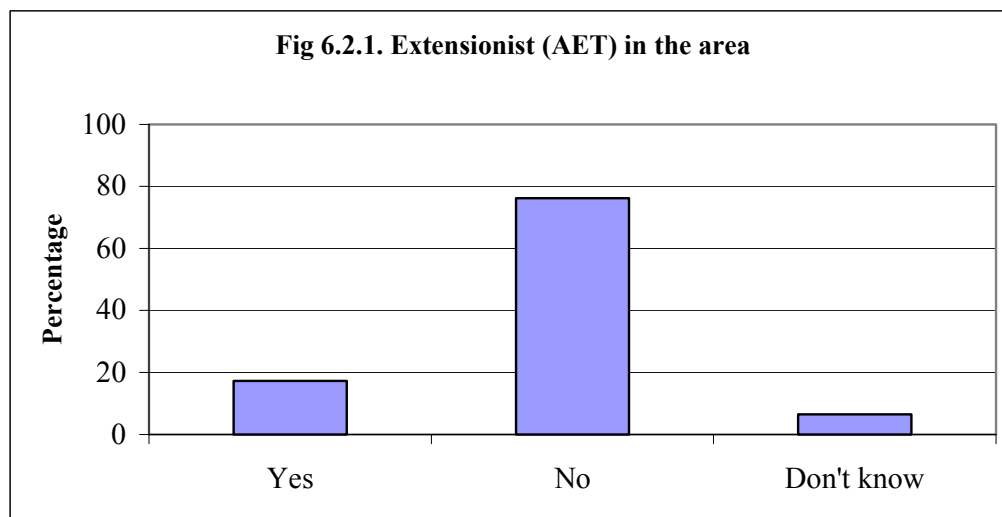
Questions reported on in this section aim to indicate levels of contact between farmers and the extension services, by various means. Such contact is the first stage in, and is indeed a pre-requisite to extension work having an impact on farmers.

### **Agricultural Extension Technicians**

It was found that despite the number of ADCs that are in almost every constituency in Oshikoto region, 76 percent of farmers interviewed claimed not to have seen any AET in their community. This is figure is worrying for extension managers and it will be a challenge over the coming years to increase levels of contact between extension staff and farmers.

**Table 6.2.1 AET in the Area**

<b>Extensionist (AET) in the area</b>	<b>Percentage (%)</b>
Yes	17.3
No	76.2
Don't know	6.5

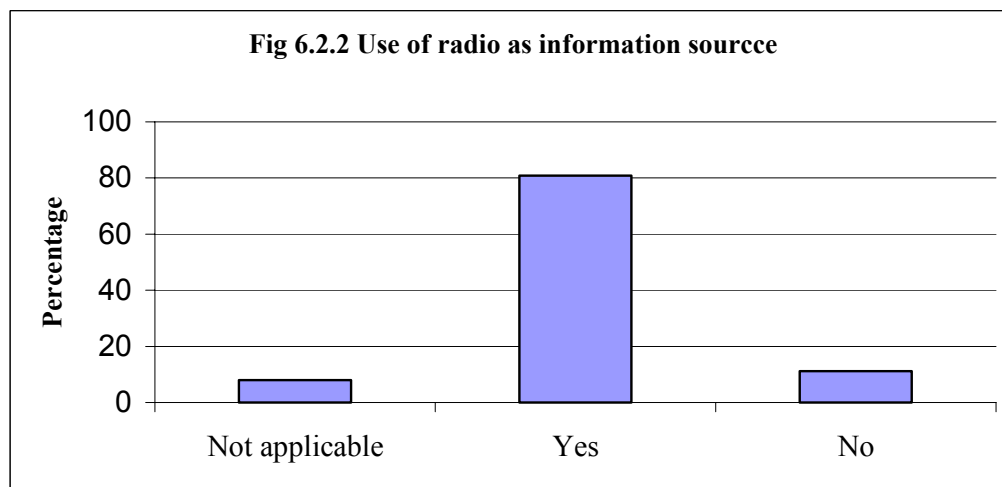


### Radio

By contrast to the preceding indicator, 80.8 % of farmers indicated that they had heard agricultural information from NBC radio. This suggests the need for the extension service to improve the quality of the information delivered via NBC radio.

**Table 6.2.2 Radio**

Got information from radio	Percentage (%)
Yes	80.8
No	11.2
Not applicable	7.9



### 6.3 EXTENSION IMPACT

This section reports on indicators of extension impact in terms of farmer awareness, farmer understanding, farmer attitudes and farmer adoption of specific extension recommendations relating to key farming issues in the region.

#### **Farmer Animal Health**

##### a) Cattle vaccination

In spite of the government effort to maintain a disease free region through the annual vaccination campaign, it was found that more than half of farmers take their animals to crush pen for vaccination as shown in the table below.

**Table 6.3.1 Cattle Vaccination**

<b>Take cattle to crush pen for vaccination yearly</b>	<b>Percentage (%)</b>
Not applicable	22.4
Yes	55.6
No	22.0

There could be several explanations why not every farmer takes his/her animals to crush pens but it is mainly because of two reasons. Firstly, long distances that have to be travelled from cattle post to the nearest crush pens as many of them are in the so-called “inland” (densely populated areas) and secondly, the lack of knowledge in animal health aspects among the farmers.

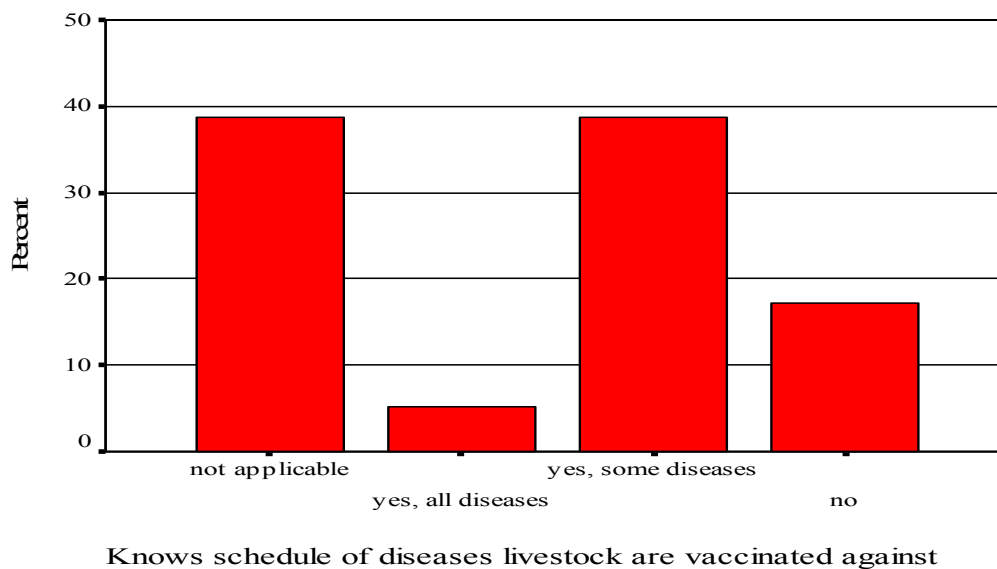
##### b) Schedule disease

**Table 6.3.2 Respondents knowing the Schedule Diseases**

<b>Known scheduled diseases of cattle</b>	<b>Percentage (%)</b>
Yes, all diseases	5.1
Yes, some diseases	38.8
No	17.3
Not applicable	38.8

It is clear in Table 6.3.2 above, which show why only fewer people take their animals to the crush pens for vaccinations. The table indicates that as low as 5.1% of the respondents knew the scheduled diseases.

**Fig 6.2.1 Respondents knowing the Schedule Diseases**



**Livestock Husbandry**

a) Castration of livestock

**Table 6.3.3 Castrate Livestock**

Continuously castrates livestock	Percentage (%)
Yes	76.6
No	15.9
Not applicable	7.5

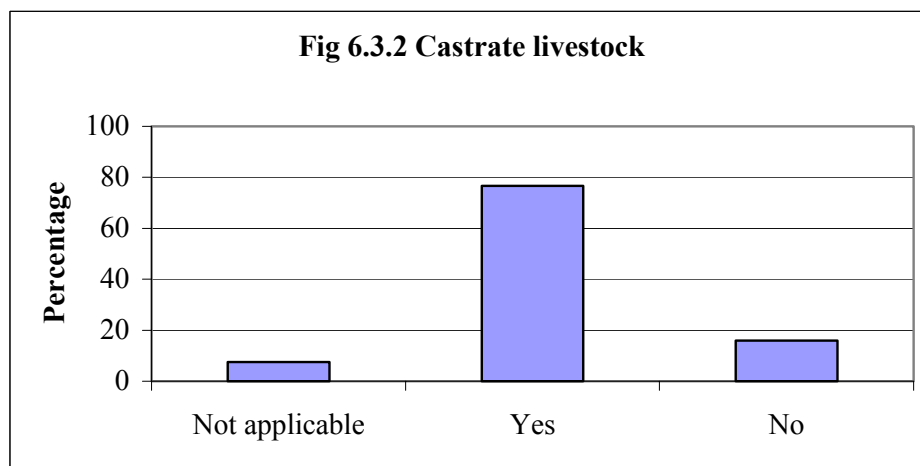


Figure 6.3.2 show that even though 5.1% of the sample do not take their animals for vaccinations 77% have the knowledge about castration and castrate their animals regularly.

b) Castration Methods

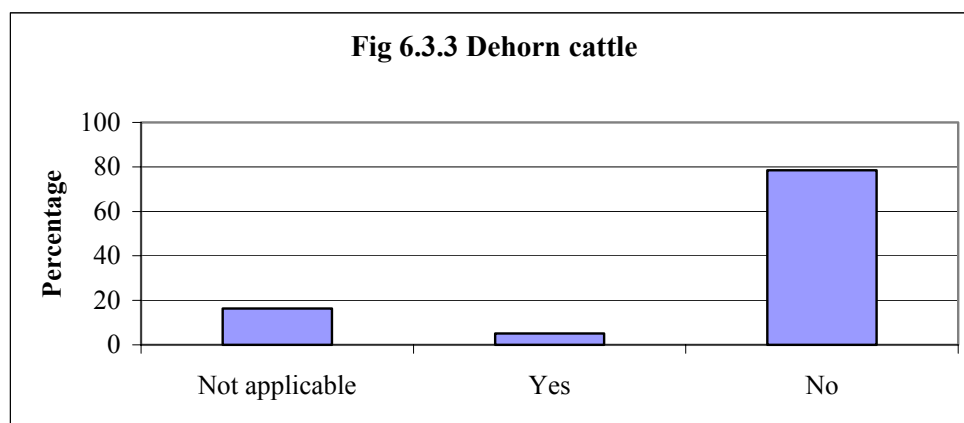
**Table 6.3.4 Castration method use mostly**

Main castration method used	Percentage (%)
Knife	27.1
Burdizzo	43.9
Rubber ring	7.0
Not applicable	22.0

c) Dehorning of cattle

**Table 6.3.5 Dehorn cattle**

Dehorns cattle	Percentage (%)
Yes	5.1
No	78.5
Not applicable	16.4



Unlike castration, dehorning of cattle is not a common practice in Oshikoto region. Only 5.1% of the sample claim to dehorn their cattle on a regular basis.

**Livestock Marketing**

a) Livestock marketing information source

**Table 6.3.6 Livestock marketing information sources**

Category	<i>Information sources</i>			
	AET	Farmer Organization	Meatco	Others
Yes	6.1	5.1	6.1	13.1
No	36.0	37.4	36.4	29.0
Not Applicable	57.9	57.5	57.5	57.9

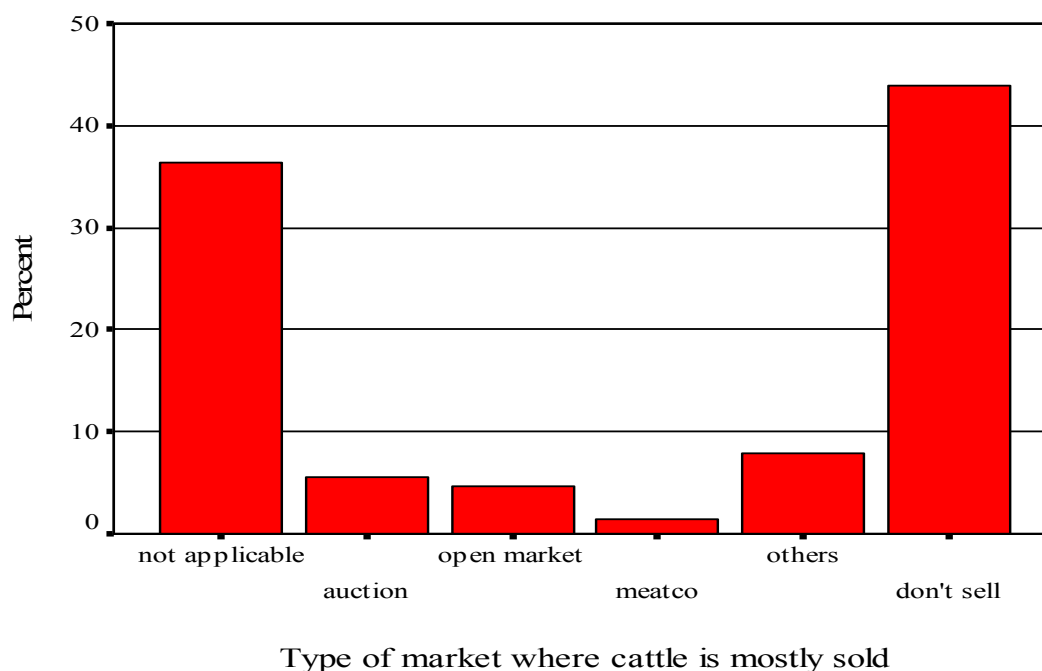
b) Market where animals are sold

**Table 6.3.7 Markets for livestock**

Market	<i>Animals</i>				
	Cattle	Small stock	Poultry	Pigs	Donkeys
Auction	5.6	0.5	-	-	0.5
Open market	4.7	9.8	21.0	10.3	-
Meatco	1.4	-	-	-	-
Others	7.9	11.7	10.7	7.0	2.3
Don't sell	43.9	55.6	59.3	36.9	54.7
Not applicable	36.4	22.4	8.4	45.8	42.5

Table 6.3.7 reveal that as far as marketing of cattle is concern, only 7.9% of the sample claim to sell their cattle to “Others” markets rather than to Meatco, Open Market or Auctions. The table shows that 5.6% of the respondents regularly sell their cattle at auctions whereas 4.7% and 1.4% sell theirs to Open Markets and Meatco respectively. The table furthers show that 9.8% and 21% of the sample stated that they normally sell both their small stock and poultry respectively to Open Market.

**Fig 6.3.4 Markets for Cattle**



c) Marketing age for oxen

The reliability of this question is dubious due to the fact that many respondents had problem of remembering the age at which they have sold their animals. In addition, some farmers lack knowledge of estimating animal ages.

**Table 6.3.8 Marketing age**

Age (years)	Percentage (%)
4-6	6.1
7-9	4.2
>9	1.9
Any age	8.4
Not applicable	79.0

**Animal Feeds**

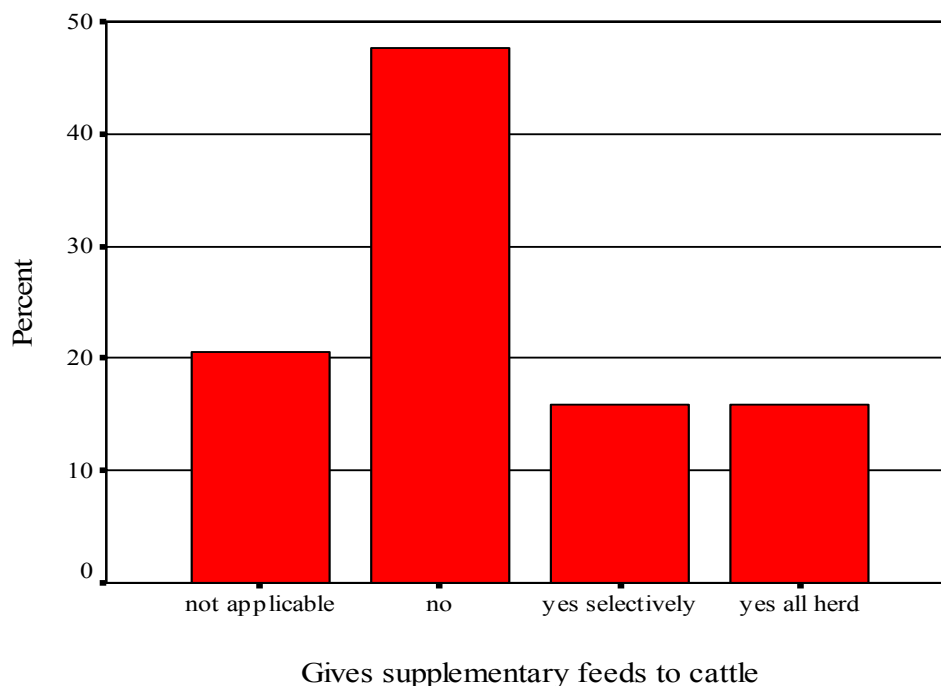
a) Supplementary feeding

It is not clear whether this question will present reliable information since it does differentiate between additional feeding and supplementary feeding. However, 31.6 percent of the respondent stated that they supplement their animals as need arise. See table below.

**Table 6.3.9 Supplementary Feeding**

Gives supplementary feeds to cattle	Percentage (%)
No	47.7
Yes selectively	15.9
Yes all herd	15.9
Not applicable	20.6

**Fig 6.3.5 Gives supplementary feeds to cattle**



b) Supplementing time

The problem of farmers not recording or recognising the time they give additional or supplementary feeds to their animals lead us to include the option of “any time” in this question to cater for those farmers who feed their animal on occasional basis.

**Table 6.3.10 Supplementing time**

<b>Time of supplement feeding</b>	<b>Percentage (%)</b>
Dry season	25.7
Rainy season	2.8
Any time	0.9
Throughout the year	0.9
Not applicable	69.6

c) Supplementary feeds

**Table 6.3.11 Type of supplementary feeds**

<b>Supplementing</b>	<b>Feeds</b>				
	<b>Salt block</b>	<b>Urea-treated straws</b>	<b>Crop residues (hay/stover)</b>	<b>Lick</b>	<b>Other feed</b>
No	0.9	0.5	28.5	2.8	1.4
Yes	30.8	31.3	3.3	29.0	30.4
Not applicable	68.2	68.2	68.2	68.2	68.2

Table 6.3.11 show that although many farmers are mostly having crops residues at hand most of the time particularly after the harvesting period, most of them do not feed these residues to their livestock as supplementary feeds. The table indicates that only 3.3% of the sample feed crop residues to their livestock as a supplement. Whilst, 31.8 and 31.3 give salt block and Urea treated straws respectively as supplement. Lick is moderately used as a supplement in Oshikoto region as only by 29% of the sample.

**Crop Seeds**

a) Crop grown

**Table 6.3.12 Crops usually grown**

<b>Crops</b>	<b>Percentage (%)</b>	
	<b>Yes</b>	<b>No</b>
Grew cereal only	0.5	99.5
Grew cereal + cotton	0.9	99.1
Grew cereal + legumes	96.3	3.7
Grew cereal + vegetables	92.5	7.5
Grew other crops	0.9	99.1

Table 6.3.12 shows that cereals, legumes and vegetables are the most commonly grown crops in Oshikoto region. Over ninety percent of the respondents claim to intercrop cereal with either vegetables or leguminous plants or both.

b) Seeds used

**Table 6.3.13 Seeds planted during the last season 2002/03**

Seeds	Percentage (%)	
	Yes	No
Local Mahangu seed	86.0	14.0
Okashana seed	48.6	51.4
Kangara seed	5.1	94.9
Local sorghum seed	95.3	4.7
Macia seed	5.6	94.4
Local cowpea seed	98.6	1.4
Nakare seed	0.9	99.1
Shindimba seed	0.9	99.1

Table 6.3.13 show that local seed crops are the ones mostly planted by Oshikoto farmers last season. The table shows that 86% of the sample has grown the local mahangu seeds whereas 95.3% and 98.6% grew the local sorghum and local cowpea seeds respectively.

**Crop Fertilizer**

a) Use of fertilizer

**Table 6.3.14 Percentage of respondents who used fertilizer**

Used fertilizer last year	Percentage (%)
Yes	40.7
No	59.3

b) Fertilizer supplier

**Table 6.3.15 Fertiliser supplier**

Buys fertilizer mainly from	Percentage (%)
ADCs	7.9
Shops	1.9
Elsewhere	18.2
Not applicable	72.0

**Crop Weeding**

a) Methods of weeding

**Table 6.3.16 Weeding Methods**

Method of weeding used in the field	Percentage (%)
DAP+ implement	0.5
Hand hoe	91.6
Both	6.5
Not applicable	1.4

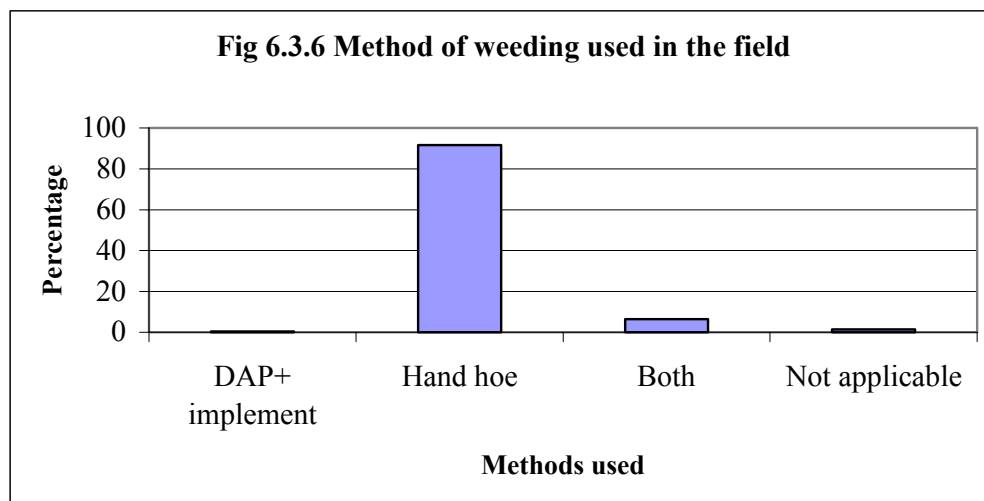


Figure 6.3.6 show that as high as 91.6% of the respondents used hand hoe on a regular basis for weeding. The figure furthers shows that despite the ministry efforts to promote the use of DAP to weed, only less than one percent has managed to adopt the technology.

b) DAP implement used

**Table 6.3.17 DAP implement used**

DAP implements mainly used for weeding	Percentage (%)
Senegalese cultivator	0.9
BS 41 cultivator	1.4
Plough	5.1
None	92.5

c) DAP better than Hand hoe

**Table 6.3.18 Comparison of DAP and hand hoe**

Thinks DAP for weeding is better than Hand hoe	Percentage (%)
Yes	62.1
No	14.5
Sometimes	7.5
Not applicable	15.9

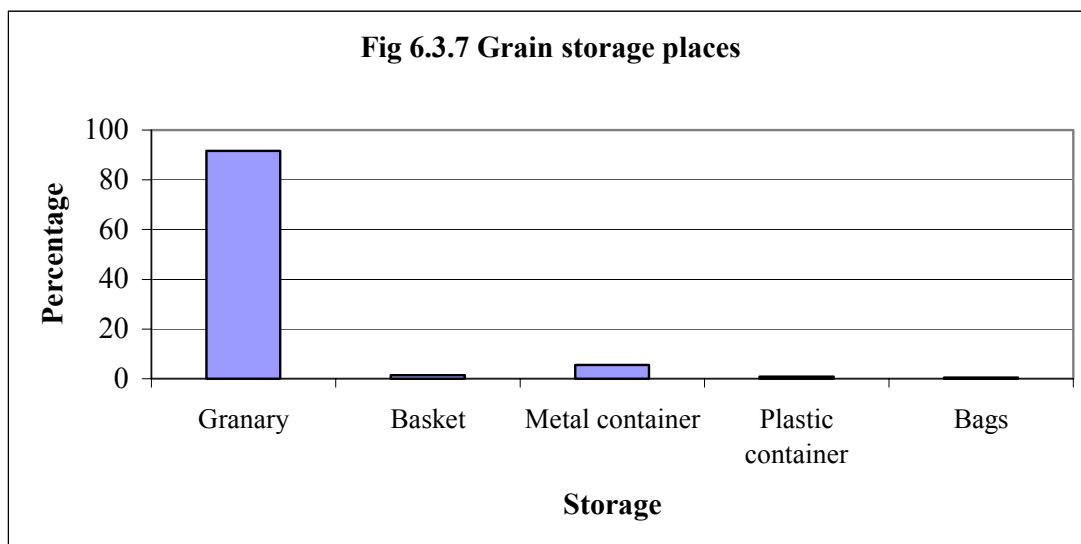
In contrast to Figure 6.3.6, table 6.3.18 shows that 62.1% of the sample admitted that DAP is far better than hand hoe to weed. This is a clear indication that should DAP implements be made available to farmers significant improvement in communal crop yields will be observed.

**Crop Storage**

a) Grain storage

**Table 6.3.19 Grain storage places**

Main type of storage used for produce	Percentage (%)
Granary	91.6
Basket	1.4
Metal container	5.6
Plastic container	0.9
Bags	0.5



Local products are always cheaper to obtain and easier to use. This is illustrated in Table 6.3.19 above where 91.6% of the respondents claim to use granary as the storage for their crop produce. Plastic containers and bags account for 0.9% and 0.5% of the sample respectively.

b) Pest management

**Table 6.3.20 Methods of controlling pest in grain storage**

Method used to minimize pest infestation in stored produce	Percentage (%)
Always keep store closed	32.2
Keep storage basket off the ground	0.9
Kill the pest on contact	2.3
Pour ash in the store	50.5
Not applicable	14.0

c) Grain market

**Table 6.3.21 Marketing of grain**

Produce mainly sold at this type of market	Percentage (%)
Open market	12.1
Agricultural shows + fairs	0.5
Elsewhere	11.2
Not applicable	76.2

d) Frequency of selling

**Table 6.3.22 Frequency of Selling**

<b>Frequency of produce sales</b>	<b>Percentage (%)</b>
Everyday	2.3
Occasionally	15.4
Once a year	6.1
Not applicable	76.2

## 6.4 CONCLUSIONS

### **Farmer Type**

Many farmers are living and farming far away from Agricultural Development Centers. At the same time the capacity of both farmers and extension workers to travel extensively in the region is limited. It may be argued that Namibia is still a country where agriculture is under developed and may only improve if more technical assistance is given to our farmers. Building ADCs in the region will not only help farmers, but will also create more interest in farming amongst those that do not farm, particularly the youth.

Most of the survey's randomly selected respondents were female. This is because more men are leaving their village households in search for work in urban areas. Taking into consideration the living standards in this country, it is quite difficult to change this kind of migratory behavior of our rural people (men and youth in particular) but the option of bringing more technical assistance to farmers should not be forgotten.

It is common knowledge that literature levels are low among our farmers, and this is partly attributed to the high number of aged farmers. Indeed, this may hinder the adoption of new technologies but efforts should be continued to encourage our senior citizens in improving their farming practices. Many people are farming more with small ruminants (goats in particular) than cattle. Efforts aimed at promoting the cattle farming with our indigenous breeds (improved Sanga), should be encouraged at all levels within the Ministry.

Apart from the State pension, more and more farmers are receiving an income from salaries and businesses. As far as development is concerned in the region, one would salute the increase in the numbers of farmers obtaining income from businesses. However, it could be more interesting if we could see more agricultural related businesses and services, as those currently in operation are few and often operate in a monopolistic way.

The survey has found that crop production is still the dominant farming practice as more and more farmers are clearing larger areas for cultivation. Training on biodiversity needs to be more emphasised in order to prevent the loss of our natural resources. There are several international conventions that our country has agreed on e.g. United Nations Convention to Combat Desertification (UNCCD), United Nations Convention on Biodiversity (UNCBD) and United Nations Framework on Climate Change (UNFCCC). These conventions have to be brought to the attention of our farmers with ample information regarding them.

### **Farmer Extension Contact**

The fact that many farmers are staying more than 20 km away from ADCs partly contributes to the low level of knowledge of AETs amongst farmers. In addition, the ratio of AET to farmers is extremely high (estimated at 1: 1869) and this has also resulted in AETs being not known by their farmers. This situation is self-explanatory, and it is up to the decision-makers in the Ministry to respond to the demand of the farmers.

Radio has been a very powerful source of information since its invention. This was again proven in the survey as more than 80% of the sample claim to use radios as their major source of agricultural information. In addition, radio has proven itself to be the easiest and cheapest way to reach many farmers simultaneously. Therefore, to enhance the awareness and adoption rates of new technologies or innovations, radio broadcasts should be used more frequently.

It is also important to note, however, that information heard on the radio and via direct contact with extension workers fulfils different and complementary roles. Radio is more suitable as a source of news and information of immediate relevance, and for creating awareness of farming

innovations. On the other hand, AET interventions are aimed at increasing understanding of a new innovations, developing associated skills, encouraging testing of an innovation by farmers, and finally supporting adoption by the farmer.

### **Extension Impact**

The Ministry carries out vaccination campaigns on a yearly basis where cattle are vaccinated against the Foot and Mouth and Contagious Bovine Pleuro-Pneumonia (CBPP). Vaccination campaigns are also mounted against Rabies, Anthrax and Newcastle disease [for chickens only]. More than half of the respondents indicated that they do not take their animals to crush pens. Many of the crush pens are located in the so-called “inland” areas, whereas most of the cattle are found at cattle posts. To improve the situation, more training in animal health issues needs to be conducted and more crush pens have to be constructed in the remoter areas. Proper information campaigns should be carried out in order to get the attention of many farmers.

It is interesting to note that over 70% of the respondents castrate their livestock. This shows that extension has done enough to spread the message. However, dehorning of cattle is poorly done. One would assume that this is partly because of the traditional perceptions that farmers have. Many farmers tend to think that horns are positively correlated with fatness and/or frame size, and hence more money. Farmers need to be given the right information regarding horns. More training should be conducted emphasizing the merits and demerits of horns on animals.

The market off-take in the whole of north central is estimated to be less than 5%. Oshikoto region has the most animals after Omusati and Ohangwena region (Table 3.4.1) in the north central regions. However, there are fewer farmers marketing their animals. This could be attributed to the lack of marketing information passed on to farmers. This survey has found that less than 7% of the respondents claim to get marketing related information from Meatco, AETs and farmer organizations. This needs a massive improvement if we are to up live to our objective of improving food security in our country. Even though many farmers in the region do not own cattle, one cannot condone the low number of farmers who sell cattle to Meatco. Joint planning and consultation between the Ministry and relevant stakeholders’ e.g. Meatco and farmer organizations should be encouraged to promote livestock marketing. While it is true the Government is indeed doing its best to promote the development of SMEs (e.g. open market butchers and restaurants) in the country, it will be advisable if the community can be encouraged to keep their SME infrastructure more hygienically.

There are few farmers who are giving supplementary or additional feeds to their animals. Extension has to put more effort into promoting animal feeding as we are living in a country where the outcome in farming depends largely on rainfall.

The recently (late 1990s) introduced cash crop, cotton, showed no significant adoption by farmers as only 0.9% claim to intercrop with their cereal crops (Table 6.3.12). It is interesting to see that more farmers are including leguminous crops and vegetables with their cereal crops. This reveals a good farmer response to extension service efforts to promote both nitrogen fixing and nutritionally beneficial plants. However, it is notable that many farmers are still using the seeds of local crops e.g. local mahangu, local cowpea and local sorghum. The adoption of Kashana no. 1 crop is moderately good, whereas those of Kangara, Macia, Nakare and Shindimba remain very low. Efforts should be made to examine the reasons for the low adoption rates of the above cultivars, and measures to rectify matters enacted accordingly. Many farmers in the north central regions use cattle or goat manure as their fertilizer.

The survey has found that even though there were fewer farmers found using DAP, there is a large demand for DAP implements, as many recognize its advantage over the hand hoe. About 62% of the sample stated that DAP is much better than hand hoe for weeding. It is a common knowledge that there are several farmers in this region, as well as in the other north central

regions, who are interested in using DAP implements for weeding. However, these implements are hardly available and this has confined farmers to using hand hoes. Many of these DAP implements are imported from other African countries such as Zimbabwe, Senegal etc., and as a result they are very expensive when they are available. The Ministry needs to consider encouraging local companies to take up the initiative of manufacturing DAP implements.

Traditional granaries proved to be the most popular grain storage container in Oshikoto region, as more than 80% of the respondents claim to use them. Granaries are cheaper, easier to get and durable, but need good maintenance. Extension officials need to give attention to educating farmers on pest management, particularly in their granaries. At the moment, many farmers are using ash of certain tree species in granaries as a method of preventing pests. More research should be done to develop the best and cheapest techniques of controlling pest using our local resources.

Finally, the degree of marketing of agricultural commodities in Oshikoto region communal areas is very low. This has been proven in this survey as only 23.8% of the respondents claimed to market their grain, while only about 20% of the respondents claimed to market their livestock. Both the Ministry and farmer organizations should do proper market research in order to provide farmers with information on marketing options.

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**ANNEXURE 1. FARMER QUESTIONNAIRE – OSHIKOTO REGION**

**Agricultural Extension Impact Assessment  
Baseline Survey  
Oshikoto Region**

**A. Farmer Characteristics**

1	Respondents name..... Village/Community..... Constituency..... Enumerator name..... Date:.....May 2003                      ADC.....		<b>Office use only</b>	
			1.1 <input type="checkbox"/>	1.2 <input type="checkbox"/>
1.1 Distance from ADC (km): <5 <input type="checkbox"/> 1, 6-10 <input type="checkbox"/> 2, 11-20 <input type="checkbox"/> 3, >20 <input type="checkbox"/> 4 1.2 Sex of respondent:                      Male <input type="checkbox"/> 1, Female <input type="checkbox"/> 2				
2	2.1 Age of the respondent? 18-34 <input type="checkbox"/> 1 35-43 <input type="checkbox"/> 2 44-55 <input type="checkbox"/> 3 >55 <input type="checkbox"/> 4		2.2 Head of the household? Spouse <input type="checkbox"/> 1 Man <input type="checkbox"/> 2 Woman <input type="checkbox"/> 3	
			2.1 <input type="checkbox"/>	2.2 <input type="checkbox"/>
3	Education: 3.1 Respondent    3.2 Any other Primary <input type="checkbox"/> 1 <input type="checkbox"/> 1 Secondary <input type="checkbox"/> 2 <input type="checkbox"/> 2 Tertiary <input type="checkbox"/> 3 <input type="checkbox"/> 3 No school <input type="checkbox"/> 4 <input type="checkbox"/> 4		3.3 Respondent farming experience? < 5 years <input type="checkbox"/> 1 6 – 10 years <input type="checkbox"/> 2 11 – 20 years <input type="checkbox"/> 3 > 20 years <input type="checkbox"/> 4	
			3.1 <input type="checkbox"/>	3.2 <input type="checkbox"/>
4	Number of people helping regularly with farm work? 4.1 Family labor                      4.2 Hired Labor <3 <input type="checkbox"/> 1 <input type="checkbox"/> 1 3-5 <input type="checkbox"/> 2 <input type="checkbox"/> 2 >5 <input type="checkbox"/> 3 <input type="checkbox"/> 3		4.3 Does farming satisfy basic household needs? Yes <input type="checkbox"/> 1 Yes (a little) <input type="checkbox"/> 2 No <input type="checkbox"/> 3 Depend on rain <input type="checkbox"/> 4	
			4.1 <input type="checkbox"/>	4.2 <input type="checkbox"/>
5	Number livestock owned: Cattle (5.1) Goats/sheep (5.2) Donkeys/Horses (5.3) Chickens (5.4) 1-10 <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 1 11-30 <input type="checkbox"/> 2 <input type="checkbox"/> 2 <input type="checkbox"/> 2 <input type="checkbox"/> 2 30-50 <input type="checkbox"/> 3 <input type="checkbox"/> 3 <input type="checkbox"/> 3 <input type="checkbox"/> 3 > 50 <input type="checkbox"/> 4 <input type="checkbox"/> 4 <input type="checkbox"/> 4 <input type="checkbox"/> 4 Don't have <input type="checkbox"/> 5 <input type="checkbox"/> 5 <input type="checkbox"/> 5 <input type="checkbox"/> 5		5.5 Area (ha) planted in 02/03. <3 <input type="checkbox"/> 1 3-7 <input type="checkbox"/> 2 > 7 <input type="checkbox"/> 3	
			5.1 <input type="checkbox"/>	5.2 <input type="checkbox"/>
6	6.1 Any other household income sources: Business <input type="checkbox"/> 1 Salary <input type="checkbox"/> 2 Wages <input type="checkbox"/> 3 Pension <input type="checkbox"/> 4 Casual work for kind <input type="checkbox"/> 5 Remittances <input type="checkbox"/> 6 Other <input type="checkbox"/> 7			
			6.1 <input type="checkbox"/>	

**B. Farmer Extension Contact**

7	7.1 Is there an AET working in your community? Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2 Don't know <input type="checkbox"/> 3	7.2 If no, do you think there should be an AET in your community? Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	7.1 <input type="checkbox"/>	7.2 <input type="checkbox"/>
8	8.1 If yes, how often did you get agricultural information from the AET last year? 1-3 times <input type="checkbox"/> 1 > 3 times <input type="checkbox"/> 2 None <input type="checkbox"/> 3	8.2 How did you find these information(s)? Very useful <input type="checkbox"/> 1 Useful <input type="checkbox"/> 2 Not applicable <input type="checkbox"/> 3	8.1 <input type="checkbox"/>	8.2 <input type="checkbox"/>
9	9.1 Are you a member of any FED group? Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	9.2 If Yes, how active is your FED group? Very active <input type="checkbox"/> 1 Active <input type="checkbox"/> 2 Not active <input type="checkbox"/> 3	9.1 <input type="checkbox"/>	9.2 <input type="checkbox"/>
10	10.1 Have you ever heard of farmer's training(s) by extension staff? Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	10.2 If Yes, what were those trainings? Leadership skills <input type="checkbox"/> 1 Demonstration <input type="checkbox"/> 2 Exposure visits <input type="checkbox"/> 3 Agricultural shows & fairs <input type="checkbox"/> 4 Others <input type="checkbox"/> 5	10.1 <input type="checkbox"/>	10.2 <input type="checkbox"/>
	10.3 Which of the training(s) have you attended? Leadership skills <input type="checkbox"/> 1 Demonstration <input type="checkbox"/> 2 Exposure visits <input type="checkbox"/> 3 Agricultural shows & fairs <input type="checkbox"/> 4 None <input type="checkbox"/> 5 Others <input type="checkbox"/> 6	10.4 After attended such training(s), have you applied any of the skills you've learned? Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	10.3 <input type="checkbox"/>	10.4 <input type="checkbox"/>

**C. Farmer Extension Impact**

<b>Mass Media</b>					
11	11.1 Where do you get your agricultural information? Radio <input type="checkbox"/> 1 Printed media <input type="checkbox"/> 2 TV <input type="checkbox"/> 3 None <input type="checkbox"/> 4	11.2 How often did you receive this information last year? Daily <input type="checkbox"/> 1 Weekly <input type="checkbox"/> 2 Monthly <input type="checkbox"/> 3 Occasionally <input type="checkbox"/> 4 None <input type="checkbox"/> 5	11.3 How did you find this information? Useful <input type="checkbox"/> 1 Somehow <input type="checkbox"/> 2 Not useful <input type="checkbox"/> 3	11.1 <input type="checkbox"/>	11.2 <input type="checkbox"/>
				11.3 <input type="checkbox"/>	

<b>2. CROPS</b>				
<b>Seeds</b>				
12	12.1 Which type crops are you growing?  Cereals only <input type="checkbox"/> 1 Cereal + Cotton <input type="checkbox"/> 2 Cereal + Legumes <input type="checkbox"/> 3 Cereal +Vegetables <input type="checkbox"/> 4 Others <input type="checkbox"/> 5	12.2 Which seeds do you normally plant?  Improved seeds <input type="checkbox"/> 1 Local seeds <input type="checkbox"/> 2 Both <input type="checkbox"/> 3	12.1	12.2
	12.3 Which of the improved seed varieties did you plant last season?  Pearl millet: Okashana 1, 2 <input type="checkbox"/> 1 Kangara <input type="checkbox"/> 2 Sorghum: Macia <input type="checkbox"/> 3 Cowpea: Nakare <input type="checkbox"/> 4 Shindimba <input type="checkbox"/> 5	12.4 Where did you buy your seeds for the two last years?  ADCs <input type="checkbox"/> 1 Local traders <input type="checkbox"/> 2 Cuca shops <input type="checkbox"/> 3 Church parish <input type="checkbox"/> 4 Elsewhere <input type="checkbox"/> 5 Don't buy <input type="checkbox"/> 6	12.3	12.4
<b>Fertilizer</b>				
13	13.1 Do you know the benefits of fertilizer use?  Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	13.2 If yes, what is it for?  To feed crops <input type="checkbox"/> 1 To kill pests <input type="checkbox"/> 2 To kill weeds <input type="checkbox"/> 3	13.3 Did you use it in the last two years?  Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	13.1 13.2 13.3
	13.4 How do you apply your fertilizer?  Broadcast <input type="checkbox"/> 1 Top dressing <input type="checkbox"/> 2 Mixing with seeds <input type="checkbox"/> 3	13.5 Where do you buy your fertilizer?  ADCs <input type="checkbox"/> 1 Shops <input type="checkbox"/> 2 Elsewhere <input type="checkbox"/> 3	13.4	13.5
<b>Weeding &amp; Draught Animal Power</b>				
14	14.1 Do you weed your field?  Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	14.2 If yes, what are the benefits of weeding?  Allow the crop to grow well <input type="checkbox"/> 1 To clean field <input type="checkbox"/> 2 Both <input type="checkbox"/> 3	14.1	14.2
	14.3 With what do you weed your field?  DAP <input type="checkbox"/> 1 Hand Hoe <input type="checkbox"/> 2 Both <input type="checkbox"/> 3	14.4 If DAP, which implements are you using?  Senegalese Cultivator <input type="checkbox"/> 1 BS 41Cultivator <input type="checkbox"/> 2 Moun Cultivator <input type="checkbox"/> 3 Plough <input type="checkbox"/> 4	14.3	14.4
	14.5 Do you think that using DAP for weeding is better than Hand Hoe?  Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2 Sometimes <input type="checkbox"/> 3		14.5	

<b>Harvesting</b>				
15	15.1 Where do you store your harvested produce?	15.2 How do you minimize the infestation of pest in your stored produce?		
	Granary <input type="checkbox"/> 1	Always keep my storage close <input type="checkbox"/> 1	15.1 15.2	
	Basket <input type="checkbox"/> 2	Keep my storage basket off the ground <input type="checkbox"/> 2	<input type="checkbox"/> <input type="checkbox"/>	
	Metal container <input type="checkbox"/> 3	Kill the pest when I see them <input type="checkbox"/> 3		
	Plastic container <input type="checkbox"/> 4	Pour Ash in my storage <input type="checkbox"/> 4		
Bags <input type="checkbox"/> 5				
<b>Marketing</b>				
16	16.1 Do you sell some of your produce?	16.2 If yes, where do you sell your produce?		
	Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	Open market <input type="checkbox"/> 1 Agricultural shows + fairs <input type="checkbox"/> 2 Elsewhere <input type="checkbox"/> 3	16.1 16.2 <input type="checkbox"/> <input type="checkbox"/>	
16	16.3 Are you happy with the prices you get for your produce?		16.3	
	Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2 Not really <input type="checkbox"/> 3		<input type="checkbox"/>	
<b>3. LIVESTOCK</b>				
<b>Husbandry</b>				
17	17.1 Do you castrate your livestock?		17.2 If yes, with what?	
	Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2		Knife <input type="checkbox"/> 1 Burdizzo <input type="checkbox"/> 2 Ring <input type="checkbox"/> 3	
17	17.3 Do you know the benefits of dehorning livestock?		17.4 Do you dehorn your livestock?	
	Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2		Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	
<b>Supplementary Feed</b>				
18	18.1 Do you know the benefits of supplementary feeding?	18.2 Do you supplement your livestock?	18.3 When do you supplement?	
	Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	Dry season <input type="checkbox"/> 1 Rainy season <input type="checkbox"/> 2 Any time <input type="checkbox"/> 3 Throughout the year <input type="checkbox"/> 4	
18	18.4 Which feeds do you supplement?		18.5 Do you supplement certain animals?	
	Salt block <input type="checkbox"/> 1 Urea-treated straws <input type="checkbox"/> 2 Crop residues (cut & carry) <input type="checkbox"/> 3 Pigeon pea <input type="checkbox"/> 4 Licks <input type="checkbox"/> 5 Others <input type="checkbox"/> 6		Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	
		18.6 If yes, which one?		18.4 18.5
		Lactating <input type="checkbox"/> 1 Draught animals <input type="checkbox"/> 2 Breeding males <input type="checkbox"/> 3 Very weak animals <input type="checkbox"/> 4 Other <input type="checkbox"/> 5		<input type="checkbox"/> <input type="checkbox"/>
				18.6
				<input type="checkbox"/>

<b>Animal Health</b>				
19	<b>19.1 Do you take your livestock to crush pens for vaccination every year?</b>  Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	<b>19.2 If No, why?</b>  No need <input type="checkbox"/> 1 No knowledge <input type="checkbox"/> 2 Crush pen too far <input type="checkbox"/> 3	<b>19.3 If yes, do you know which diseases livestock are vaccinated against at crush pens?</b>  Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	19.1 <input type="checkbox"/> 19.2 <input type="checkbox"/>  19.3 <input type="checkbox"/>
	<b>19.4 Did you (family member) receive any training in prevention, diagnosis &amp; treatment of diseases, from extension staffs?</b> Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2			19.4 <input type="checkbox"/>
<b>Marketing</b>				
20	<b>20.1 Do you regularly receive any information on livestock marketing prices?</b>  Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	<b>20.2 From whom do you receive these information's?</b>  AETs <input type="checkbox"/> 1 Farmers organizations <input type="checkbox"/> 2 Meatco <input type="checkbox"/> 3 Others <input type="checkbox"/> 4	<b>20.3 Which of your livestock do you sell most?</b>  Small stock <input type="checkbox"/> 1 Large stock <input type="checkbox"/> 2 Poultry <input type="checkbox"/> 3 Don't sell <input type="checkbox"/> 4 Don't own <input type="checkbox"/> 5	20.1 <input type="checkbox"/> 20.2 <input type="checkbox"/>  20.3 <input type="checkbox"/>
	<b>Where do you sell your livestock mostly?</b> 20.4 Cattle   20.5 Small stock   20.6 Poultry   20.7 Pigs   20.8 Donkeys Auction <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 1 Open market <input type="checkbox"/> 2 <input type="checkbox"/> 2 <input type="checkbox"/> 2 <input type="checkbox"/> 2 <input type="checkbox"/> 2 Meatco <input type="checkbox"/> 3 <input type="checkbox"/> 3 <input type="checkbox"/> 3 <input type="checkbox"/> 3 <input type="checkbox"/> 3 Others <input type="checkbox"/> 4 <input type="checkbox"/> 4 <input type="checkbox"/> 4 <input type="checkbox"/> 4 <input type="checkbox"/> 4			20.4 <input type="checkbox"/> 20.5 <input type="checkbox"/>  20.6 <input type="checkbox"/> 20.7 <input type="checkbox"/>  20.8 <input type="checkbox"/>
	<b>20.9 During which season do you sell your livestock?</b>  Summer <input type="checkbox"/> 1 Winter <input type="checkbox"/> 2 Autumn <input type="checkbox"/> 3 Spring <input type="checkbox"/> 4 Any season <input type="checkbox"/> 5		<b>20.10 At what age do you sell your steers/oxen?</b>  4-6 years <input type="checkbox"/> 1 7-9 years <input type="checkbox"/> 2 >9 years <input type="checkbox"/> 3 Any age <input type="checkbox"/> 4	

**D. General**

21	<b>21.1 Apart from what you are farming with currently, are you considering of farming with something new?</b>  Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2	<b>21.2 If yes, why?</b>  Earn more income <input type="checkbox"/> 1 Have more assets/property <input type="checkbox"/> 2 Be able to feed my family <input type="checkbox"/> 3	21.1 <input type="checkbox"/> 21.2 <input type="checkbox"/>
	<b>21.3 Have you realized any improvements in your farming activities due to extension services?</b> Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2 Somehow <input type="checkbox"/> 3		21.3 <input type="checkbox"/>



## ANNEXURE 2. QUESTIONNAIRE RESULTS TABLES – OSHIKOTO REGION

### SECTION A. FARMER TYPE

#### NEAREST AGRICULTURAL DEVELOPMENT CENTRE (ADC)

Agric Dev Centre	FED group member		Total
	Yes	No	
Onyuulaye		7.0%	6.5%
Onankali	20.0%	31.7%	30.8%
Okashana	53.3%	27.1%	29.0%
Oshigambo	26.7%	29.1%	29.0%
Onayena		5.0%	4.7%
	100.00%	99.90%	100.00%

#### DISTANCE OF FARMER/RESPONDENT FROM ADC

Variable	Category	FED Membership		Group Total
		Yes	No	
Distance from ADC	< 5Km	6.7%	11.6%	11.2%
	6-10Km	20.0%	9.5%	10.3%
	11-20Km	46.7%	35.7%	36.4%
	> 20Km	26.7%	43.2%	42.1%

#### SELECTED FARMER TYPE VARIABLES

Variable	Category	FED Membership		Group Total
		Yes	No	
Sex of respondent	Male	33.3%	33.2%	33.2%
	Female	66.7%	66.8%	66.8%
Age of respondent	15-30	13.3%	26.6%	25.7%
	31-45	40.0%	20.1%	21.5%
	46-60	26.7%	17.6%	18.2%
	>60	20.0%	35.7%	34.6%
Household head	Spouse	80.0%	59.3%	60.7%
	Man	6.7%	11.1%	10.7%
	Woman	13.3%	29.6%	28.5%
Education level of respondent	Primary	73.3%	61.8%	62.6%
	Secondary	20.0%	26.1%	25.7%
	Tertiary	6.7%	1.0%	1.4%
	No school		11.1%	10.3%
Highest education level of member in the household	aNot applicable		5.0%	4.7%
	Primary	33.3%	34.7%	34.6%
	Secondary	60.0%	48.7%	49.5%
	Tertiary	6.7%	6.0%	6.1%
	No school		5.5%	5.1%
Respondent farming experience	<5 years	20.0%	18.1%	18.2%
	6-10 years	26.7%	20.1%	20.6%
	11-20 years	26.7%	26.6%	26.6%

	>20 years	26.7%	35.2%	34.6%
Persons in the household helping regularly with farm work	<3	13.3%	28.6%	27.6%
	3-5	53.3%	36.2%	37.4%
	>5	33.3%	35.2%	35.0%
Hired labour	None	33.3%	30.2%	30.4%
	<3	20.0%	42.7%	41.1%
	3-5	33.3%	7.5%	9.3%
	>5	13.3%	19.6%	19.2%
Farming satisfies basic household needs	Yes	20.0%	10.1%	10.7%
	Yes (a little)	33.3%	38.2%	37.9%
	No	6.7%	20.1%	19.2%
	Depends on rain	40.0%	31.7%	32.2%

### LIVESTOCK OWNERSHIP

Variable	Category	FED Membership		Group Total
		Yes	No	
Cattle	1-10	20.0%	23.1%	22.9%
	11-30	13.3%	23.6%	22.9%
	30-50	26.7%	5.0%	6.5%
	>50	6.7%	4.0%	4.2%
	Don't have	33.3%	44.2%	43.5%
Goats and sheep	1-10	13.3%	24.1%	23.4%
	11-30	26.7%	34.2%	33.6%
	30-50	6.7%	14.1%	13.6%
	>50	26.7%	5.0%	6.5%
	Don't have	26.7%	22.6%	22.9%
Donkeys/horses	1-10	40.0%	42.2%	42.1%
	11-30		2.5%	2.3%
	30-50		.5%	.5%
	>50		.5%	.5%
	Don't have	60.0%	54.3%	54.7%
Poultry	1-10	40.0%	57.8%	56.5%
	11-30	40.0%	32.2%	32.7%
	30-50		3.5%	3.3%
	>50	13.3%	1.5%	2.3%
	Don't have	6.7%	5.0%	5.1%

### CROP PRODUCTION

Variable	Category	FED Membership		Group Total
		Yes	No	
Total area planted in 2002/2003	none		2.5%	2.3%
	<3	13.3%	29.6%	28.5%
	3-7	73.3%	61.3%	62.1%
	>7	13.3%	6.5%	7.0%

### SOURCES OF INCOME OTHER THAN AGRICULTURE

Variable	Category	FED Membership		Group Total
		Yes	No	Total
Business	Not applicable		.5%	.5%
	Yes	26.7%	32.2%	31.8%
	No	73.3%	67.3%	67.8%
Salary	Not applicable		.5%	.5%
	Yes	60.0%	36.7%	38.3%
	No	40.0%	62.8%	61.2%
Wage	Not applicable		.5%	.5%
	Yes	13.3%	3.5%	4.2%
	No	86.7%	96.0%	95.3%
Pension	Not applicable		.5%	.5%
	Yes	33.3%	41.7%	41.1%
	No	66.7%	57.8%	58.4%
Casual work for kind	Not applicable		.5%	.5%
	Yes	26.7%	25.1%	25.2%
	No	73.3%	74.4%	74.3%
Remittances	Not applicable		.5%	.5%
	Yes	6.7%	7.0%	7.0%
	No	93.3%	92.5%	92.5%
Other source	Not applicable		.5%	.5%
	Yes	6.7%	.5%	.9%
	No	93.3%	99.0%	98.6%

### SECTION B. FARMER CONTACT

#### EXTENSION: FARMER CONTACT INDICATORS

Variable	Category	FED Membership		Group Total
		Yes	No	Total
Extensionist (AET) exists and works in the area	Yes	53.3%	14.6%	17.3%
	No	40.0%	78.9%	76.2%
	Don't know	6.7%	6.5%	6.5%
There should be an AET in your community	Not applicable	53.3%	15.1%	17.8%
	Yes	40.0%	76.9%	74.3%
	No	6.7%	8.0%	7.9%
Times got info from AET last year	None	53.3%	85.4%	83.2%
	1-3 times	33.3%	12.1%	13.6%
	>3 times	13.3%	2.5%	3.3%
Usefulness of information got from AET	Not applicable	53.3%	87.4%	85.0%
	Very useful	40.0%	6.0%	8.4%
	Useful	6.7%	6.5%	6.5%
Level of activeness of FED group	Not applicable	13.3%	99.0%	93.0%
	Very active	40.0%	1.0%	3.7%
	Active	40.0%		2.8%
	Not active	6.7%		.5%

### FARMER TRAINING

Variable	Category	FED Membership		Group Total
		Yes	No	
Has heard of farmer training by extension staff	Yes	66.7%	26.6%	29.4%
	No	33.3%	73.4%	70.6%
Aware (heard of ) the training	Not applicable	33.3%	72.9%	70.1%
	Leadership skills	26.7%	4.5%	6.1%
	Demonstration	20.0%	3.5%	4.7%
	Exposure visits		.5%	.5%
	Agric. Shows & fairs		3.0%	2.8%
	Others		2.0%	1.9%
Has attended leadership training in	Don't know	20.0%	13.6%	14.0%
	Not applicable	33.3%	37.2%	36.9%
	Yes	20.0%	1.5%	2.8%
	No	46.7%	61.3%	60.3%

### ATTENDANCE AT OTHER EXTENSION ACTIVITIES

Variable	Category	FED Membership		Group Total
		Yes	No	
Has attended demonstration	Not applicable	33.3%	37.2%	36.9%
	Yes	20.0%	1.5%	2.8%
	No	46.7%	61.3%	60.3%
Has attended exposure visit	Not applicable	40.0%	36.7%	36.9%
	Yes		.5%	.5%
	No	60.0%	62.8%	62.6%
Has attended agric. shows/fairs	Not applicable	40.0%	36.2%	36.4%
	Yes		1.0%	.9%
	No	60.0%	62.8%	62.6%
Has attended no training	Not applicable	33.3%	34.2%	34.1%
	Yes	53.3%	57.8%	57.5%
	No	13.3%	8.0%	8.4%
Has attended other training	Not applicable	40.0%	34.7%	35.0%
	Yes		.5%	.5%
	No	60.0%	64.8%	64.5%
After training has applied skills	Not applicable	53.3%	92.0%	89.3%
	Yes	26.7%	2.5%	4.2%
	No	20.0%	5.5%	6.5%

### Mass Media in Extension

Variable	Category	FED Membership		Group Total
		Yes	No	
Got information from radio	Not applicable	20.0%	7.0%	7.9%
	Yes	80.0%	80.9%	80.8%
	No		12.1%	11.2%
Got information from printed media	Not applicable	73.3%	47.7%	49.5%
	Yes		4.5%	4.2%
	No	26.7%	47.7%	46.3%
Got information from TV	Not applicable	73.3%	49.7%	51.4%
	Yes		.5%	.5%
	No	26.7%	49.7%	48.1%
Times received info from radio last year	None	20.0%	18.6%	18.7%
	Daily	13.3%	13.1%	13.1%
	Weekly	20.0%	33.7%	32.7%
	Monthly	20.0%	10.6%	11.2%
	Occasionally	26.7%	24.1%	24.3%
Times received info from print last year	None	100.0%	95.0%	95.3%
	Daily		.5%	.5%
	Weekly		1.0%	.9%
	Monthly		.5%	.5%
	Occasionally		3.0%	2.8%
Times received info from TV last year	None	100.0%	99.5%	99.5%
	Daily		.5%	.5%
Usefulness of info on the radio	Not applicable	20.0%	19.1%	19.2%
	Useful	80.0%	64.8%	65.9%
	Somehow		13.1%	12.1%
	Not useful		3.0%	2.8%
Usefulness of info from printed materials	Not applicable	100.0%	95.5%	95.8%
	Useful		3.5%	3.3%
	Somehow		1.0%	.9%
Usefulness of info on from TV	Not applicable	100.0%	99.0%	99.1%
	Useful		.5%	.5%
	Not useful		.5%	.5%

## **SECTION C. EXTENSION IMPACT INDICATORS**

### **CROPS GROW**

Variable	Category	FED Group Membership		Total
		Yes	No	
Grew cereal only	Yes		.5%	.5%
	No	100.0%	99.5%	99.5%
Grew cereal + cotton	Yes	6.7%	.5%	.9%
	No	93.3%	99.5%	99.1%
Grew cereal + legumes	Yes	100.0%	96.0%	96.3%
	No		4.0%	3.7%
Grew cereal + vegetables	Yes	86.7%	93.0%	92.5%
	No	13.3%	7.0%	7.5%
Grew other crops	Yes		1.0%	.9%
	No	100.0%	99.0%	99.1%

### **USE OF IMPROVED SEED**

Variable	Category	FED Group Membership		Total
		Yes	No	
Plants local Mahangu seed	Yes	60.0%	87.9%	86.0%
	No	40.0%	12.1%	14.0%
Plants Okashana seed	Yes	80.0%	46.2%	48.6%
	No	20.0%	53.8%	51.4%
Plants Kangara seed	Yes		5.5%	5.1%
	No	100.0%	94.5%	94.9%
Plants local sorghum seed	Yes	93.3%	95.5%	95.3%
	No	6.7%	4.5%	4.7%
Plants Macia seed	Yes	6.7%	5.5%	5.6%
	No	93.3%	94.5%	94.4%
Plants Local cowpea seed	Yes	100.0%	98.5%	98.6%
	No		1.5%	1.4%
Plants Nakare seed	Yes		1.0%	.9%
	No	100.0%	99.0%	99.1%
Plants Shindimba seed	Yes	6.7%	.5%	.9%
	No	93.3%	99.5%	99.1%

### SOURCES OF SEED

Variable	Category	FED Membership		GroupTotal
		Yes	No	
Bought seed last year from ADCs	Yes	33.3%	16.6%	17.8%
	No	66.7%	83.4%	82.2%
Bought seed last year from local trader	Yes	6.7%	14.6%	14.0%
	No	93.3%	85.4%	86.0%
Bought seed last year from cuca shops	Yes	6.7%	5.5%	5.6%
	No	93.3%	94.5%	94.4%
Bought seed last year from church parish	Not applicable		.5%	.5%
	Yes	6.7%	2.0%	2.3%
	No	93.3%	97.5%	97.2%
Bought seed last year from elsewhere	Yes	13.3%	15.6%	15.4%
	No	86.7%	84.4%	84.6%
Did not buy seed last year	Yes	46.7%	56.8%	56.1%
	No	53.3%	43.2%	43.9%

### FERTILISER USE

Variable	Category	FED Membership		GroupTotal
		Yes	No	
Knows benefits of fertiliser use	No	60.0%	36.7%	38.3%
	To feed crops	33.3%	60.8%	58.9%
	To kill pests	6.7%	2.5%	2.8%
Used fertilizer last year	Yes	26.7%	41.7%	40.7%
	No	73.3%	58.3%	59.3%
Method of fertiliser application	Not applicable	66.7%	52.8%	53.7%
	Broadcast	20.0%	30.2%	29.4%
	Top dressing		7.0%	6.5%
	Mixing with seed	13.3%	10.1%	10.3%
Buys fertilizer mainly from	Not applicable	73.3%	71.9%	72.0%
	ADCs	13.3%	7.5%	7.9%
	Shops		2.0%	1.9%
	Elsewhere	13.3%	18.6%	18.2%

### WEEDING PRACTICE

Variable	Category	FED Membership		GroupTotal
		Yes	No	
Method of weeding used in the field	Not applicable		1.5%	1.4%
	DAP+ implement	6.7%		.5%
	Hand hoe	80.0%	92.5%	91.6%
	Both	13.3%	6.0%	6.5%
DAP implements mainly used for weeding	None	80.0%	93.5%	92.5%
	Senegalese cultivator	6.7%	.5%	.9%
	BS 41 cultivator	6.7%	1.0%	1.4%
	Plough	6.7%	5.0%	5.1%
Thinks that using DAP for weeding is better than Hand hoe	Not applicable	26.7%	15.1%	15.9%
	Yes	66.7%	61.8%	62.1%
	No		15.6%	14.5%
	Sometimes	6.7%	7.5%	7.5%

### GRAIN STORAGE

Variable	Category	FED Membership		GroupTotal
		Yes	No	
Main type of storage used for produce	Granary	86.7%	92.0%	91.6%
	Basket		1.5%	1.4%
	Metal container	6.7%	5.5%	5.6%
	Plastic container		1.0%	.9%
	Bags	6.7%		.5%

### GRAIN STORAGE PEST MANAGEMENT

Variable	Category	FED Membership		GroupTotal
		Yes	No	
Method used to minimize pest infestation in stored produce	Not applicable	13.3%	14.1%	14.0%
	Always keep store closed	26.7%	32.7%	32.2%
	Keep storage basket off the ground		1.0%	.9%
	Kill the pest on contact		2.5%	2.3%
	Pour ash in the store	60.0%	49.7%	50.5%

### GRAIN MARKETING

Variable	Category	FED Membership		GroupTotal
		Yes	No	
Sells some of the produce	Yes	40.0%	23.1%	24.3%
	No	60.0%	76.9%	75.7%
Produce mainly sold at this type of market	Not applicable	60.0%	77.4%	76.2%
	Open market	33.3%	10.6%	12.1%
	Agricultural shows + fairs		.5%	.5%
	Elsewhere	6.7%	11.6%	11.2%
Frequency of produce sales	Not applicable	60.0%	77.4%	76.2%
	Everyday		2.5%	2.3%
	Occasionally	33.3%	14.1%	15.4%
	Once a year	6.7%	6.0%	6.1%

### ANIMAL HUSBANDRY

Variable	Category	FED Membership		GroupTotal
		Yes	No	
Castrates livestock	Not applicable	13.3%	7.0%	7.5%
	Yes	73.3%	76.9%	76.6%
	No	13.3%	16.1%	15.9%
Main castration method used	Not applicable	20.0%	22.1%	22.0%
	Knife	13.3%	28.1%	27.1%
	Burdizzo	53.3%	43.2%	43.9%
	Rubber ring	13.3%	6.5%	7.0%
Knows benefits of dehorning livestock	Not applicable	13.3%	13.1%	13.1%
	Yes	20.0%	16.6%	16.8%
	No	66.7%	70.4%	70.1%
Dehorns livestock	Not applicable	13.3%	16.6%	16.4%
	Yes	13.3%	4.5%	5.1%
	No	73.3%	78.9%	78.5%

### SUPPLEMENTARY FEEDING

Variable	Category	FED Membership		GroupTotal
		Yes	No	
Knows the benefits of supplementary feeding	Not applicable	13.3%	9.5%	9.8%
	Yes	40.0%	45.2%	44.9%
	No	46.7%	45.2%	45.3%
Gives supplementary feeds to cattle	Not applicable	20.0%	20.6%	20.6%
	No	46.7%	47.7%	47.7%
	Yes selectively	20.0%	15.6%	15.9%
	Yes all herd	13.3%	16.1%	15.9%
Time of supplement feeding	Not applicable	66.7%	69.8%	69.6%
	Dry season	26.7%	25.6%	25.7%
	Rainy season	6.7%	2.5%	2.8%
	Any time		1.0%	.9%
	Throughout the year		1.0%	.9%

### SELECTIVE SUPPLEMENTARY FEEDING

Variable	Category	FED Membership		Group Total
		Yes	No	
Selectively give supplementary feed to Draft animals	Not applicable	73.3%	82.4%	81.8%
	No		4.0%	3.7%
	Yes selectively	26.7%	13.6%	14.5%
Selectively give supplementary feed to lactating	Not applicable	73.3%	82.4%	81.8%
	No		4.0%	3.7%
	Yes selectively	26.7%	13.6%	14.5%
Selectively give supplementary feed to breeding males	Not applicable	73.3%	82.4%	81.8%
	No		1.0%	.9%
	Yes selectively	26.7%	16.6%	17.3%
Selectively give supplementary feed to weaners	Not applicable	73.3%	82.4%	81.8%
	No		2.0%	1.9%
	Yes selectively	26.7%	15.6%	16.4%
Selectively give supplementary feed to weak animals	Not applicable	73.3%	82.4%	81.8%
	No	20.0%	12.6%	13.1%
	Yes selectively	6.7%	5.0%	5.1%

### TYPES OF SUPPLEMENTARY FEED USED

Variable	Category	FED Membership		Group Total
		Yes	No	
Salt block	Not applicable	60.0%	68.8%	68.2%
	No		1.0%	.9%
	Yes	40.0%	30.2%	30.8%
Urea-treated straws	Not applicable	60.0%	68.8%	68.2%
	No		.5%	.5%
	Yes	40.0%	30.7%	31.3%
Crop residues (hay/stover)	Not applicable	60.0%	68.8%	68.2%
	No	33.3%	28.1%	28.5%
	Yes	6.7%	3.0%	3.3%
Lick	Not applicable	60.0%	68.8%	68.2%
	No		3.0%	2.8%
	Yes	40.0%	28.1%	29.0%
Other feed	Not applicable	60.0%	68.8%	68.2%
	No		1.5%	1.4%
	Yes	40.0%	29.6%	30.4%

### ANIMAL HEALTH

Variable	Category	FED Membership		GroupTotal
		Yes	No	
Cattle taken to crush pen for vaccination yearly	Not applicable	13.3%	23.1%	22.4%
	Yes	66.7%	54.8%	55.6%
	No	20.0%	22.1%	22.0%
Reason for not vaccinating cattle	Not applicable	93.3%	92.5%	92.5%
	No need		1.5%	1.4%
	No knowledge	6.7%	4.5%	4.7%
	Crush pen too far		1.5%	1.4%
Knows the scheduled diseases livestock are vaccinated against	Not applicable	26.7%	39.7%	38.8%
	Yes, all diseases	13.3%	4.5%	5.1%
	Yes, some diseases	46.7%	38.2%	38.8%
	No	13.3%	17.6%	17.3%
Received training from DEES in prevention, diagnosis & treatment of diseases	Not applicable	13.3%	8.0%	8.4%
	Yes	13.3%	10.6%	10.7%
	No	73.3%	81.4%	80.8%

### LIVESTOCK TYPE SOLD MOST

Variable	Category	FED Membership		GroupTotal
		Yes	No	
Livestock type sold most	Not applicable	6.7%	1.0%	1.4%
	Small stock	26.7%	14.6%	15.4%
	Large stock	26.7%	11.6%	12.6%
	Poultry	13.3%	19.6%	19.2%
	Don't sell	26.7%	49.7%	48.1%
	Don't own		3.5%	3.3%

### SOURCES OF INFORMATION ON LIVESTOCK MARKETING

Variable	Category	FED Membership		Group Total
		Yes	No	
Receives livestock marketing information regularly	Yes	46.7%	23.6%	25.2%
	No	53.3%	76.4%	74.8%
Receives livestock marketing information from AETs	Not applicable	20.0%	60.8%	57.9%
	Yes	26.7%	4.5%	6.1%
	No	53.3%	34.7%	36.0%
Receives livestock marketing information from Farmer organisation	Not applicable	20.0%	60.3%	57.5%
	Yes	13.3%	4.5%	5.1%
	No	66.7%	35.2%	37.4%
Receives livestock marketing information from Meatco	Not applicable	20.0%	60.3%	57.5%
	Yes	13.3%	5.5%	6.1%
	No	66.7%	34.2%	36.4%
Receives livestock marketing information from Others	Not applicable	20.0%	60.8%	57.9%
	Yes	26.7%	12.1%	13.1%
	No	53.3%	27.1%	29.0%

### TYPE OF MARKET WHERE LIVESTOCK ARE MOSTLY SOLD

Variable	Category	FED Membership		GroupTotal
		Yes	No	
Type of market where cattle is mostly sold	Not applicable	20.0%	37.7%	36.4%
	Auction	13.3%	5.0%	5.6%
	Open market	6.7%	4.5%	4.7%
	Meatco		1.5%	1.4%
	Others	13.3%	7.5%	7.9%
Type of market where small stock is mostly sold	Don't sell	46.7%	43.7%	43.9%
	Not applicable	20.0%	22.6%	22.4%
	Auction		.5%	.5%
	Open market	20.0%	9.0%	9.8%
	Others	20.0%	11.1%	11.7%
Type of market where poultry is mostly sold	Don't sell	40.0%	56.8%	55.6%
	Not applicable	6.7%	8.5%	8.4%
	Open market	46.7%	19.1%	21.0%
	Others	13.3%	10.6%	10.7%
	Don't sell	33.3%	61.3%	59.3%
Type of market where pigs is mostly sold	54.00		.5%	.5%
	Not applicable	26.7%	47.2%	45.8%
	Open market	33.3%	8.5%	10.3%
	Others	13.3%	6.5%	7.0%
	Don't sell	26.7%	37.7%	36.9%
Type of market where donkey is mostly sold	Not applicable	33.3%	43.2%	42.5%
	Auction		.5%	.5%
	Others		2.5%	2.3%
	Don't sell	66.7%	53.8%	54.7%

### SEASON FOR SELLING MOST LIVESTOCK

Variable	Category	FED Membership		GroupTotal
		Yes	No	
Season for selling most livestock	Not applicable	33.3%	50.3%	49.1%
	Summer		5.0%	4.7%
	Winter		3.5%	3.3%
	Autumn		3.0%	2.8%
	Spring	13.3%	.5%	1.4%
	Any season	53.3%	37.7%	38.8%

### AGE AT WHICH MOST LIVESTOCK ARE SOLD

Variable	Category	FED Membership		Group Total
		Yes	No	
Age at which most livestock is sold	Not applicable	60.0%	80.4%	79.0%
	4-6 years	13.3%	5.5%	6.1%
	7-9 years	6.7%	4.0%	4.2%
	>9 years	6.7%	1.5%	1.9%
	Any age	13.3%	8.0%	8.4%
	Not applicable		.5%	.5%

### ATTITUDE TO NEW FARMING PRACTICES AND TECHNOLOGIES

Variable	Category	FED Membership		Group Total
		Yes	No	
Considering farming with new things	Yes	73.3%	53.3%	54.7%
	No	26.7%	46.7%	45.3%
Reasons for considering new farm opportunities	Not applicable	26.7%	45.7%	44.4%
	Earn more income	33.3%	19.1%	20.1%
	Have more assets/property	6.7%	17.6%	16.8%
	Be able to feed my family	33.3%	17.6%	18.7%

### PERCEPTION THAT IMPROVED FARMING IS DUE TO EXTENSION SUPPORT

Variable	Category	FED Membership		Group Total
		Yes	No	
Realized improvements in farming due to extension activities	Yes	53.3%	29.6%	31.3%
	No	40.0%	61.3%	59.8%
	Somehow	6.7%	9.0%	8.9%

### **BIVARIATE ANALYSIS ( Cross tabulations)**

Selected extension Impact Indicators were analysed in relation to **the distance of the farmer – respondent from the local Agricultural Development Centre (ADC)**. This was done to explore that hypothesis that those farmers living close to the ADC will have had greater exposure to extension services and that this will be reflected in the impact indicators.

#### **Crops Grown x Distance from ADC**

Variable	Category	Distance from ADC				Total
		< 5Km	6-10Km	11-20Km	> 20Km	Col %
		Col %	Col %	Col %	Col %	
Grew cereal only	Yes			1.3%		.5%
	No	100.0%	100.0%	98.7%	100.0%	99.5%
Grew cereal + cotton	Yes			2.6%		.9%
	No	100.0%	100.0%	97.4%	100.0%	99.1%
Grew cereal + legumes	Yes	91.7%	100.0%	92.3%	100.0%	96.3%
	No	8.3%		7.7%		3.7%
Grew cereal + vegetables	Yes	100.0%	45.5%	97.4%	97.8%	92.5%
	No		54.5%	2.6%	2.2%	7.5%
Grew other crops	Yes		9.1%			.9%
	No	100.0%	90.9%	100.0%	100.0%	99.1%

#### **USE OF IMPROVED SEED X DISTANCE FROM ADC**

Variable	Category	Distance from ADC				Total
		< 5Km	6-10Km	11-20Km	> 20Km	Col %
		Col %	Col %	Col %	Col %	
Plants local mahangu seed	Yes	91.7%	77.3%	82.1%	90.0%	86.0%
	No	8.3%	22.7%	17.9%	10.0%	14.0%
Plants Okashana seed	Yes	66.7%	68.2%	55.1%	33.3%	48.6%
	No	33.3%	31.8%	44.9%	66.7%	51.4%
Plants Kangara seed	Yes	8.3%	4.5%	7.7%	2.2%	5.1%
	No	91.7%	95.5%	92.3%	97.8%	94.9%
Plants local sorghum seed	Yes	95.8%	90.9%	93.6%	97.8%	95.3%
	No	4.2%	9.1%	6.4%	2.2%	4.7%
Plants Macia seed	Yes	8.3%	13.6%	7.7%	1.1%	5.6%
	No	91.7%	86.4%	92.3%	98.9%	94.4%
Plants Local cowpea seed	Yes	95.8%	95.5%	98.7%	100.0%	98.6%
	No	4.2%	4.5%	1.3%		1.4%
Plants Nakare seed	Yes		9.1%			.9%
	No	100.0%	90.9%	100.0%	100.0%	99.1%
Plants Shindimba seed	Yes		4.5%	1.3%		.9%
	No	100.0%	95.5%	98.7%	100.0%	99.1%

### Weeding x Distance from ADC

Variable	Category	Distance from ADC				Total Col %
		< 5Km	6-10Km	11-20Km	> 20Km	
Method of weeding used in the field	Not applicable		4.5%	2.6%		1.4%
	DAP+ implement			1.3%		.5%
	Hand hoe	100.0%	54.5%	92.3%	97.8%	91.6%
	Both		40.9%	3.8%	2.2%	6.5%
Thinks that using DAP for weeding is better than Hand hoe	Not applicable		9.1%	19.2%	18.9%	15.9%
	Yes	75.0%	63.6%	59.0%	61.1%	62.1%
	No	16.7%	13.6%	14.1%	14.4%	14.5%
	Sometimes	8.3%	13.6%	7.7%	5.6%	7.5%

### Grain Marketing x Distance from ADC

Variable	Category	Distance from ADC				Total
		< 5Km	6-10Km	11-20Km	> 20Km	
Sells some of the produce	Yes	25.0%	27.3%	23.1%	24.4%	24.3%
	No	75.0%	72.7%	76.9%	75.6%	75.7%

### Supplementary Feeding x Distance from ADC

Variable	Category	Distance from ADC				Total
		< 5Km	6-10Km	11-20Km	> 20Km	
Gives supplementary feeds to cattle	Not applicable	29.2%	4.5%	17.9%	24.4%	20.6%
	No	33.3%	45.5%	42.3%	56.7%	47.7%
	Yes selectively	20.8%	27.3%	15.4%	12.2%	15.9%
	Yes all herd	16.7%	22.7%	24.4%	6.7%	15.9%

**Selective Supplementary Feeding x Distance from ADC**

Variable	Category	Distance from ADC				Total
		< 5Km	6-10Km	11-20Km	> 20Km	
Selectively give supplementary feed to Draft animals	not applicable	79.2%	63.6%	79.5%	88.9%	81.8%
	No	4.2%	9.1%	2.6%	3.3%	3.7%
	Yes	16.7%	27.3%	17.9%	7.8%	14.5%
Selectively give supplementary feed to lactating	not applicable	79.2%	63.6%	79.5%	88.9%	81.8%
	No		13.6%	3.8%	2.2%	3.7%
	Yes	20.8%	22.7%	16.7%	8.9%	14.5%
Selectively give supplementary feed to breeding males	Not applicable	79.2%	63.6%	79.5%	88.9%	81.8%
	No			2.6%		.9%
	Yes	20.8%	36.4%	17.9%	11.1%	17.3%
Selectively give supplementary feed to weaners	Not applicable	79.2%	63.6%	79.5%	88.9%	81.8%
	No		9.1%	2.6%		1.9%
	Yes	20.8%	27.3%	17.9%	11.1%	16.4%
Selectively give supplementary feed to weak animals	Not applicable	79.2%	63.6%	79.5%	88.9%	81.8%
	No	8.3%	27.3%	16.7%	7.8%	13.1%
	Yes	12.5%	9.1%	3.8%	3.3%	5.1%

### TYPES OF SUPPLEMENTARY FEED X DISTANCE FROM ADC

Variable	Category	Distance from ADC				Total
		< 5Km	6-10Km	11-20Km	> 20Km	
Salt block is the supplement feed	Not applicable	75.0%	36.4%	60.3%	81.1%	68.2%
	No		4.5%		1.1%	.9%
	Yes selectively	25.0%	59.1%	39.7%	17.8%	30.8%
Urea-treated straws is the supplement feed	Not applicable	75.0%	36.4%	60.3%	81.1%	68.2%
	No			1.3%		.5%
	Yes selectively	25.0%	63.6%	38.5%	18.9%	31.3%
Crop residues (hay) is the supplement feed	Not applicable	75.0%	36.4%	60.3%	81.1%	68.2%
	No	20.8%	59.1%	34.6%	17.8%	28.5%
	Yes selectively	4.2%	4.5%	5.1%	1.1%	3.3%
Lick is the supplement feed	Not applicable	75.0%	36.4%	60.3%	81.1%	68.2%
	No		4.5%	5.1%	1.1%	2.8%
	Yes selectively	25.0%	59.1%	34.6%	17.8%	29.0%
Other feed is the supplement feed	Not applicable	75.0%	36.4%	60.3%	81.1%	68.2%
	No		4.5%	1.3%	1.1%	1.4%
	Yes selectively	25.0%	59.1%	38.5%	17.8%	30.4%

Selected extension impact indicators were analysed in relation to the whether the respondent was **a male or female head of household or was the spouse of the head of the household**. This was done to explore that hypothesis that the gender of the head of household was not related to exposure to extension services as reflected in the impact indicators.

### Various Impact Indicators x Sex of Head of Household

Variable	Category	Household head		
		Spouse	Man	Woman
Total number of cattle owned	No	21.5%	8.7%	18.0%
	Depends on rain	33.8%	21.7%	32.8%
	1-10	29.2%	13.0%	13.1%
	11-30	23.8%	21.7%	21.3%
	30-50	7.7%	8.7%	3.3%
	>50	5.4%	8.7%	
Total number of goats and sheep owned	Don't have	33.8%	47.8%	62.3%
	1-10	22.3%	13.0%	29.5%
	11-30	38.5%	21.7%	27.9%
	30-50	13.1%	17.4%	13.1%
	>50	7.7%	4.3%	4.9%

Total number of donkeys/horses owned	Don't have	18.5%	43.5%	24.6%
	1-10	54.6%	17.4%	24.6%
	11-30	3.1%		1.6%
	30-50	.8%		
	>50	.8%		
Total number of poultry owned	Don't have	40.8%	82.6%	73.8%
	1-10	54.6%	56.5%	60.7%
	11-30	35.4%	26.1%	29.5%
	30-50	2.3%	8.7%	3.3%
	>50	2.3%		3.3%
Sells some of the produce	Don't have	5.4%	8.7%	3.3%
	Yes	28.5%	17.4%	18.0%
Main type of storage used for produce	No	71.5%	82.6%	82.0%
	Granary	93.1%	91.3%	88.5%
	Basket	2.3%		
	Metal container	3.1%	4.3%	11.5%
	Plastic container	.8%	4.3%	
	Bags	.8%		
	Not applicable	13.1%	21.7%	13.1%
Method used to minimize pest infestation in stored produce	Always keep store closed	33.1%	39.1%	27.9%
	Keep storage basket off the ground	.8%		1.6%
	Kill the pest on contact	.8%	4.3%	4.9%
	Pour ash in the store	52.3%	34.8%	52.5%
	Not applicable	72.3%	82.6%	82.0%
Produce mainly sold at this type of market	Open market	15.4%	8.7%	6.6%
	Agricultural shows + fairs	.8%		
	Elsewhere	11.5%	8.7%	11.5%
Cattle taken to crush pen for vaccination yearly	Not applicable	19.2%	17.4%	31.1%
	Yes	64.6%	52.2%	37.7%
Livestock type sold most	No	16.2%	30.4%	31.1%
	Not applicable		4.3%	3.3%
	Small stock	15.4%	21.7%	13.1%
	Large stock	18.5%		4.9%
	Poultry	16.9%	17.4%	24.6%
	Don't sell	47.7%	56.5%	45.9%
	Don't own	1.5%		8.2%

Selected extension impact indicators were analysed in relation to the whether the **respondent perceived that farming activities satisfied basic household income needs.**

**Sources of Household Income x Farmer Perceptions as to Whether Farming Satisfies Basic Household Needs**

Sources of household income other than farming	Variable	Farming satisfies basic household needs				Total
		Yes	Yes (a little)	No	Depends on rain	
Business	Not applicable		1.2%			.5%
	Yes	26.1%	27.2%	41.5%	33.3%	31.8%
	No	73.9%	71.6%	58.5%	66.7%	67.8%
Salary	Not applicable		1.2%			.5%
	Yes	56.5%	35.8%	31.7%	39.1%	38.3%
	No	43.5%	63.0%	68.3%	60.9%	61.2%
Wage	Not applicable		1.2%			.5%
	Yes	8.7%	2.5%	4.9%	4.3%	4.2%
	No	91.3%	96.3%	95.1%	95.7%	95.3%
Pension	Not applicable		1.2%			.5%
	Yes	43.5%	40.7%	19.5%	53.6%	41.1%
	No	56.5%	58.0%	80.5%	46.4%	58.4%
Casual work for kind	Not applicable		1.2%			.5%
	Yes	21.7%	12.3%	24.4%	42.0%	25.2%
	No	78.3%	86.4%	75.6%	58.0%	74.3%
Remittances	Not applicable		1.2%			.5%
	Yes	4.3%	7.4%	4.9%	8.7%	7.0%
	No	95.7%	91.4%	95.1%	91.3%	92.5%
Other source	Not applicable		1.2%			.5%
	Yes		1.2%		1.4%	.9%
	No	100.0%	97.5%	100.0%	98.6%	98.6%

Selected extension impact indicators were analysed in relation to the whether the **total number of small stock owned by the respondent**. This was done to explore that hypothesis that small stock ownership was related to the impact of extension messages related to livestock. It may have been expected that owners of larger stock numbers would be more likely to employ recommended practices.

### Livestock Practices x Small Stock Owned

Variable	Category	Total number of goats and sheep owned				Don't have
		1-10	11-30	30-50	>50	
Livestock type sold most	Not applicable					6.1%
	Small stock	16.0%	16.7%	31.0%	28.6%	
	Large stock	16.0%	11.1%	13.8%	28.6%	6.1%
	Poultry	22.0%	13.9%	20.7%	7.1%	26.5%
	Don't sell	46.0%	55.6%	34.5%	35.7%	51.0%
Main castration method used	Don't own		2.8%			10.2%
	Not applicable	14.0%	8.3%	6.9%		65.3%
	Knife	36.0%	33.3%	27.6%	7.1%	14.3%
	Burdizzo	44.0%	48.6%	62.1%	64.3%	20.4%
	Rubber ring	6.0%	9.7%	3.4%	28.6%	
Dehorns livestock	Not applicable	8.0%	11.1%			46.9%
	Yes	4.0%	6.9%	3.4%	14.3%	2.0%
	No	88.0%	81.9%	96.6%	85.7%	51.0%

Selected extension impact indicators were analysed in relation to the whether the **total number of cattle owned by the respondent**. This was done to explore that hypothesis that cattle ownership was related to the impact of extension messages related to livestock. It may have been expected that owners of larger stock numbers would be more likely to employ recommended practices.

**Total Number of Cattle Owned x Various**

Variable	Category	TOTAL NUMBER OF CATTLE OWNED					Total
		1-10	11-30	30-50	>50	Don't have	Col %
Livestock type sold most	Not applicable					3.2%	1.4%
	Small stock	20.4%	18.4%	7.1%	22.2%	11.8%	15.4%
	Large stock	12.2%	22.4%	28.6%	66.7%		12.6%
	Poultry	20.4%	16.3%	21.4%		21.5%	19.2%
	Don't sell	44.9%	40.8%	42.9%	11.1%	58.1%	48.1%
Main castration method used	Don't own	2.0%	2.0%			5.4%	3.3%
	Not applicable	4.1%	4.1%			46.2%	22.0%
	Knife	30.6%	22.4%	21.4%	55.6%	25.8%	27.1%
	Burdizzo	59.2%	71.4%	71.4%	44.4%	17.2%	43.9%
Dehorns livestock	Rubber ring	6.1%	2.0%	7.1%		10.8%	7.0%
	Not applicable		2.0%			36.6%	16.4%
	Yes	8.2%	8.2%	7.1%		2.2%	5.1%
Gives supplementary feeds to cattle	No	91.8%	89.8%	92.9%	100.0%	61.3%	78.5%
	Not applicable		4.1%			45.2%	20.6%
Cattle taken to crush pen for vaccination yearly	No	49.0%	42.9%	42.9%	66.7%	48.4%	47.7%
	Yes selectively	14.3%	28.6%	57.1%	11.1%	4.3%	15.9%
	Yes all herd	36.7%	24.5%		22.2%	2.2%	15.9%
Type of market where cattle is mostly sold	Not applicable		6.1%			48.4%	22.4%
	Yes	91.8%	91.8%	100.0%	100.0%	6.5%	55.6%
	No	8.2%	2.0%			45.2%	22.0%
Type of market where cattle is mostly sold	Not applicable	2.0%	6.1%		11.1%	78.5%	36.4%
	Auction	4.1%	8.2%	14.3%	22.2%	2.2%	5.6%
	Open market	2.0%	10.2%	7.1%	22.2%	1.1%	4.7%
	Meatco	2.0%	2.0%		11.1%		1.4%
	Others	12.2%	10.2%	14.3%	33.3%	1.1%	7.9%
	Don't sell	77.6%	63.3%	64.3%		17.2%	43.9%

Selected extension impact indicators were analysed in relation to the whether the total area planted with crops by the farmer/respondent. This was done to test whether there was a relationship between the area cropped and the employment of recommended practices.

**Total area planted in 2002/2003 x Crop Husbandry and Marketing Practice**

Variable	Category	Total area planted in 2002/2003				Total
		none	<3	3-7	>7	
Sells some of the produce	Yes	20.0%	8.2%	30.1%	40.0%	24.3%
	No	80.0%	91.8%	69.9%	60.0%	75.7%
Knows benefits of fertiliser use	No	60.0%	39.3%	34.6%	60.0%	38.3%
	To feed crops	40.0%	59.0%	61.7%	40.0%	58.9%
	To kill pests		1.6%	3.8%		2.8%
Method of weeding used in the field	Not applicable		1.6%	1.5%		1.4%
	DAP+ implement			.8%		.5%
	Hand hoe	80.0%	91.8%	91.0%	100.0%	91.6%
	Both	20.0%	6.6%	6.8%		6.5%

**Extensionist (AET) exists and works in the area x Times got info from AET last year**

Variable	Category	Extensionist (AET) exist and work in the area			Total
		YES	No	don't know	
Times got info from AET last year	None	2.7%	100.0%	100.0%	83.2%
	1-3 times	78.4%			13.6%
	>3 times	18.9%			3.3%

**FED GROUP MEMBER X PERCEPTION OF LEVEL OF ACTIVENESS OF FED GROUP**

Variable	Category	FED group member		Total Col %
		Yes	No	
Level of activeness of FED group	Not applicable	13.3%	99.0%	93.0%
	Very active	40.0%	1.0%	3.7%
	Active	40.0%		2.8%
	Not active	6.7%		.5%

**After training has applied skills x Attendance at Extension Activity**

Variable	Category	After training has applied skills			Total
		Not applicable	Yes	No	
Has attended leadership training in	Not applicable	40.3%		14.3%	36.9%
	Yes		66.7%		2.8%
	No	59.7%	33.3%	85.7%	60.3%
Has attended demonstration	Not applicable	40.3%		14.3%	36.9%
	Yes		55.6%	7.1%	2.8%
	No	59.7%	44.4%	78.6%	60.3%
Has attended exposure visit	Not applicable	39.8%	11.1%	14.3%	36.9%
	Yes		11.1%		.5%
	No	60.2%	77.8%	85.7%	62.6%
Has attended agric. Shows/fairs	Not applicable	39.3%	11.1%	14.3%	36.4%
	Yes	.5%	11.1%		.9%
	No	60.2%	77.8%	85.7%	62.6%
Has attended none training	Not applicable	36.6%	11.1%	14.3%	34.1%
	Yes	58.1%	22.2%	71.4%	57.5%
	No	5.2%	66.7%	14.3%	8.4%
Has attended other training	Not applicable	37.7%	11.1%	14.3%	35.0%
	Yes			7.1%	.5%
	No	62.3%	88.9%	78.6%	64.5%

**DAP IMPLEMENTS MAINLY USED FOR WEEDING X METHOD OF WEEDING USED IN THE FIELD**

Variable	Category	DAP implements mainly used for weeding				Total
		None	Senegalese cultivator	BS 41 cultivator	Plough	
Method of weeding used in the field	Not applicable	1.5%				1.4%
	DAP + implement	.5%				.5%
	Hand hoe	97.5%	100.0%	33.3%		91.6%
	Both	.5%		66.7%	100.0%	6.5%