A COMPARATIVE STUDY ON INDIGENOUS APPROACHES TO FOOD SECURITY AMONG DIFFERENT BATSWANA ETHNIC GROUPS IN THE NORTH WEST PROVINCE: CASES FROM CENTRAL AND RUSTENBURG REGIONS

A RESEARCH REPORT SUBMITTED IN PARTIAL FULLFILMENT FOR A MASTERS DEGREE IN SOCIOLOGY OF DEVELOPMENT, FACULTY OF SOCIAL SCIENCES, UNIVERSITY OF NORTH WEST

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DECLARATION

I declare that this dissertation herein submitted for a Degree of Masters of Sociology at the University of North West, has never been previously submitted by me for a degree at this or any University. It is my work in design and execution and all material contained herein has been duly acknowledged.

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ABSTRACT

Different Batswana ethnic groups in Central and Rustenburg regions of the North –West Province depend on agriculture for their food supply and livelihoods. These ethnic groups include the Bahurutshe in Moshana, Barolong in Seweding, Bakwena in Pella and Bakgatla in Moruleng. Agriculture as their source of food, also remained an important source for cash income used for purchasing other household utilities and consumables. Indigenous knowledge is a local knowledge acquired by local people through the accumulation of experiences, informal experiments and intimate understanding of the environment in a given culture. It remains knowledge mostly used for food security and production.

Food security is a system of meeting long-term needs of food whereby all people have access to enough nutritious food at all times. This goes beyond food production to preservation and storage. Other important components of food security are land, water, forests and livestock. Food security interventions in rural areas have to be addresses within the context of poverty alleviation. Reducing poverty in South Africa, especially in rural areas, require substantial changes in the distribution of income, wealth and economic power.

Through the process of innovation and adaptation different Batswana ethnic groups managed to develop different food security approaches from which they ensured food security among their societies. Indigenous food security systems practiced by different Batswana ethnic groups are the basis for sustainable agriculture and provision of livelihoods. These approaches also let to the transmission of norms, values and skills used by local communities from one generation to the next. They include the systems of soil fertility management, multiple cropping and the application of soil conditioners.

The study found that Batswana farmers had evolved food production practices which are highly divers and far from static. They have acquired a fund of knowledge on the production and utilization of a wide range of food crop species. Rarely do traditional farmers' fields contain only one crop, they are either mixed or planted on separate parts of the field. Their fields represent a complex of species which provide them with their basic requirements, i.e. food and income throughout the year.

The study recommends that the government should formulate policies that will indicate their use of indigenous knowledge in food security. This will help local communities control their seeds and crops, and also make them save their indigenous species of crops.
This study goes further to recommend that the study communities should be encouraged to use their indigenous equipment for agricultural production.

Unless indigenous food security becomes part and parcels of curriculum a lot of traditional knowledge will be lost. This study therefore recommends further research in areas of sustainable utilization of indigenous technology, knowledge related aspects of food security in rural areas as part of an integrated rural development strategy.

LIST OF TABLES

TABLE OF CONTENTS **PAGE No.**

CHAPTER 1

BACKGROUND

1.1 INTRODUCTION

Leidenfrost (1993: 1) defines food security as access to the food needed for a healthy life by all people at all times. Achieving food security has three dimensions. First, it is necessary to ensure a safe and nutritionally adequate food supply both at the household and at the national level. Secondly, it is necessary to have a reasonable degree of stability in the supply of food year in and year out. Thirdly, is the need to ensure that each household has physical, social and economic access to food in order to meet its needs.

Other authors like Abbott (1992: 185) and Hinrichs (2000: 296) indicates that indigenous food security systems include an array of indigenous market arrangements such as local farmer's market, local- community supported agriculture, local or indigenous bakeries and breweries, indigenous food processors. Abbott (ibid) further suggests that national and household food security should focus on the ability of the nation or the household to meet consumption needs in terms of access to food. Securing food depends on the availability of food and the physical and economic access to available food.

These mean that each household must have the knowledge and the ability to produce and to procure the food that is needed on a sustainable basis. Of out most importance in our economy is ensuring that families have access to income to purchase food. According to World Development Report (1990: 92), an important way to protect the living standards of the poor is by guaranteeing their food security i.e. by making sure that they can acquire adequate food at all times.

The conditions of the hungriest people are strikingly similar all over the world including South Africa. Continued poverty, which is manifested in food insecurity, affects a large number of South African population. Approximately fourteen (14) million South Africans are considered to be vulnerable to food insecurity, meaning that they are unable to consume a sufficient number of calories (The Land Redistribution Program, 2000: 1).

Women, children and the elderly are more susceptible to food insecurity, particularly in the former homelands. Apart from rural areas, food insecurity can be observed in urban areas this is due to unemployment and lack of knowledge about food security itself.

High levels of poverty, unemployment and seasonal variability in income levels mean that many households in South Africa find themselves unable to meet their daily food requirements. Employment in the country has been declining since the 1970's, largely due to the substitution of manual work by mechanism and it is declining rapidly today (Van der Merwe, 1995). Unemployment has a negative impact on number of people's food security in the country. Severe unemployment and the inability to pay for goods and services highlight the need for poor or rural households to depend on natural resources. Without adequate access to natural resources and products, they would face extreme poverty.

There exist an alternative to the western epistemology about food security and procurement. According to Indigenous Knowledge & Development Monitor (1999:19), Indigenous Knowledge (IK) is a cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generation by cultural transmission, about the relationship of living being with one another and with their environment. Hence, Indigenous knowledge (IK) is seen a key to successful participation of local people in agricultural production and in rural development programmes because the introduction of western technologies which emphasizes the application of agrochemicals, machinery and expensive methods of irrigation have led to pollution and land degradation. They are expensive and leave several of the poor population in absolute poverty, and most of these machineries are bought on credit and use external service for repair. The consequences are observed in rural and urban poor communities.

Furthermore Rajasekaran (1993: 1) defines indigenous knowledge as a systematic body of knowledge acquired by local people through the accumulation of experience, informal experiments and intimate understanding of the environment in a given culture. Local people, including farmers, women, landless labourers and rural artisans are the custodians

of indigenous knowledge systems (IKS). They are well informed about situations, resources and their food security approaches. Too often, there are no systematic records documenting these knowledge systems and how appropriate they can be utilized in many survival strategies including food security. Indigenous knowledge as the basis for decision-making is often overlooked or not known to development workers seeking solutions to food security problems. For many local or indigenous households, the problem of access to food can be addressed through indigenous approaches.

Indigenous knowledge is also considered to be the basis for agriculture, health care and environmental conservation. While indigenous food security systems in most rural communities are basis for sustainable agriculture given association between local, direct agriculture and internal- input farming. This is linked to methods which are endogenous. Most of agricultural and food security strategies developed by local people throughout the centuries were based on these technologies.

In modern day Africa and the world at large, household food supply can be enhanced when food processing technologies are available. In African, the most popular of these is the grinding mill for millet, maize sorghum or mixed grains. Such technologies are soughed by village across the continents (Snyder, 1990:5). It has always been basic to rural or indigenous people's struggle for survival to produce enough nutritious food for the family and to maintain the productive capacity of the land using local technologies. Reijntjies, et al. (1992: 37) suggests that through a process of innovation and adaptation, local people developed different food security approaches, appropriate to the local ecological, economic, socio- cultural and political environment.

Through the practice of methods of food security and agricultural production different norms and values of local communities were transmitted between generations. For example, the systems practiced for soil management, systems of shifting cultivation, minimum tillage, reaping, ridging and terracing, multiple cropping, mulching and application of soil conditioners (Prah, 1991: 32).

STATEMENT OF THE PROBLEM

The study was guided by the following research questions: -

- What indigenous food production methods and measures do these communities in Central and Eastern regions use to ensure food security in terms of ploughing, food storage, food processing, etc?
- How is indigenous knowledge utilized in local communities in Central and Eastern regions to ensure sustainable food production and security?
- What role does gender differences play in food production and security?
- What are the limitations of the existing food security approaches in terms of decreasing farmers' dependence on credits alleviating rural poverty, etc?
- What are the problems encountered by indigenous communities with regard to agricultural production in terms of keeping livestock, using their own seeds, etc?
- What is the Government policy towards promoting indigenous knowledge systems in food security?

1.2 RATIONALE OF THE STUDY

This was because few investigations have been conducted on indigenous approaches to food production and food security among different Batswana ethnic groups in Eastern and Central regions in the North-West Province. This study contributed to the social and agricultural development of the Central and Eastern regions and of the province as a whole.

1.3. AIM OF THE STUDY

This study looked at the indigenous approaches to food security among different Batswana ethnic groups in Central and Eastern regions of the North- West Province. These regions were selected because they are Batswana dominated and ethnic groups residing in these regions practice different indigenous approaches to food security.

1.4. OBJECTIVES OF THE STUDY

The following specific aspects were investigated: -

- Indigenous food production methods and measures used by local communities in Central and Eastern regions in terms of field cultivation, food processing, storage, etc to ensure food security.
- The utilization of indigenous knowledge in these communities to ensure sustainable food production and security.
- The gender roles in food production and security.
- Problems encountered by indigenous communities with regard to agricultural production
- Government policy towards the role of indigenous knowledge systems in promoting food security.

1.5. LITERATURE REVIEW

Agricultural policies in developing countries have focused too narrowly on maximizing short- term profits rather than on long- term sustainable management of local resources by local farmers and people. In 1987, the World Commission on Environment and Development (WCED) called attention to the immense problem and challenge facing world agriculture. Those problems are, meeting present and future food needs and the need for a new approach to agricultural development and food security.

According to Reijnjies, et. al (1992: xvii) global food security depends not only raising global production but also on reducing distortion in the structure of the world food market and on shifting focus of food production to food deficit countries, regions and on households. The shifting in agricultural production will be sustained only if the resource base is sustained and enhanced.

The main emphasis on developing countries falls on adequate food production and food security. Over the next quarter-century grave problem of food insecurity will affect hundreds of millions of people in developing countries. Almost 800 million people in the developing world do not have enough to eat and another thirty- four (34) million people in industrialized countries and economies in transition also suffer from chronic food insecurity (WFS, 1999: 1).

The Food and Agriculture Organization of the United Nations, FAO (1999: 32) revealed that the total number of people that will encounter food insecurity by the year 2015 will be six- hundred and thirty- five (635) million. Concerns about food security have been part of the everyday social and natural science debate from many years ago. Food security and its manifestation famine can be seen much in terms of poverty and its underlying conditions but mainly in terms of food production deficits. Since the beginning of the nineties there have been worries potential future food production deficits and been voiced with increasing existence.

Abbott (1992: 185) states that food problems occur particularly in less favourable ecological areas and in population groups where socio-economic circumstances prevent an adequate food intake. In many developing countries, it is difficult to produce enough food for local demand while still providing crops for important export markets. This limited food production leads many populations in developing countries to poverty.

Recent approaches to agricultural production and food security in developing countries are failing to reduce absolute numbers of food insecurity and ensuring environmental sustainability. However the view of how to improve global, national and household food security vary greatly and tends to focus solely on increasing production. Sustainable intensification of agriculture is known to offer significant opportunities to improve food production. Food production is only part of the broader picture. Food security and hence people's access to land and food are other parts of the picture and must be improved (Pretty, et. al, 1999: 27).

Food output in most developing countries have been declining. The Novartis Foundation for Sustainable Development, NFSD (2000: 1) indicates that the degree of self-sufficiency in grain in most African countries, South of the Sahara and the Middle East, have declined rapidly, and in these regions grains are important staples. This shows that most of the poor in these regions starve to death because of poverty.

In many developing countries, food output decline as a result of soil erosion, soil pollution, aquifer depletion, and the loss of soil organic matter and salting of irrigated land. Developing countries are much dependent on Western technologies, often with scarce attention to develop or upgrade them but to exploit indigenous science and technology. Developing nations have to accept that Western technologies are meant to meet the needs of Westerners and they are appropriate for their socio-cultural norms. When transferred to developing nations their assimilation is always a major problem (Prah, 1991: 34).

Local people have always had different ways of improving soil structures, water holding capacity and nutrients, and water availability in their lands. These have increased their food production for present and future generations without the use of artificial inputs. In many cases, their systems are sophisticated forms of ecological agriculture fine-tuned to specific environmental conditions but they are overlooked or ignored by scientific experts because they are not recorded.

Agricultural researchers and extension workers usually are not aware of local knowledge on classification systems of local farmers and people regarding soil, seeds and crops. Indigenous soil types are considered better for long-term sustainability of the soil structure and fertility.
Because soil analysts in soil testing laboratories (STL's) are not familiar with indigenous classification, their fertilizer recommendations may not fit with local soil categories (Rajasekaran, 1993: 3).

In Chengalpattu District, Tamil Nadu State, a project conducted indicates that indigenous classification of rice varieties is based on criteria such as water sources, cropping season, and crop duration and grain quality. Several varieties suitable to semi-arid zones of Tamil Nadu are adapted to several drought conditions and most of the varieties being encouraged through agricultural extension system were not suitable for the state but suitable for resource rich environments such as those with ensured supply of irrigation.

The International Future Programme, IFP (2000: 3) pointed out that there are two broad option for achieving food security at national and household level, i.e. food self-sufficiency which means satisfaction of food needs primarily through domestic supply, and food self reliance implying maintaining a level of domestic production in order to meet the food needs of the population.

National governments of developing countries have to improve their food policies and actions through research, evaluation and involvement of the public. They must involve local people in making solutions to food insecurity (National Consultation in Food Security, 1997: 2). Poverty in developing countries made their agricultural policies central to food security strategies. In South Africa, one of the main objectives of the agricultural policy is to improve household food security through expansion and a more equitable distribution of resources. The countries agricultural policy reform is also intended to support the emergence of a diversified production structure with a large increase in the numbers of successful smallholder farming enterprises. Their success depends on the deregulation of domestic agriculture and the removal of policies that distort and interfere with people's rights to produce food for themselves. This can improve the efficiency in indigenous agricultural systems, from production to processing, storage, distribution and consumption. This will also lead to the availability and affordability of nutritional food (Departmental News, 1999: 3).

Efforts of introducing modern agricultural systems in most African countries with the aim of securing food fail because there is little or no attempt made to consider the cultural prerequisites of such development systems imposed from outside. Such a situation leads to destruction and the ruin of African cultures. The things people eat and the way they produce, process, save and eat them form part of their culture. It is necessary to make people feel proud of their heritage. Indigenous approaches to food production and food security used in different local communities form part of their heritage. They should not allow themselves to acculturation, which will destroy their personality and lead them to dependency, deforestation and hunger.

Too little attention in developing countries is paid to the role played by local farmers, women and artisans in the development and food security process, and in the acquisition of their technologies, especially because they would be of most important use to the rural and poor majority.

Commercial interests and government support motivated developers to concentrate in the importation of products and machinery from outside. These policies hindered indigenous innovation. Indigenous people practicing in the field lost over their local resources and over decisions making that affected their future (Prah, 1991: 35).

Community development approaches, including food security approaches, are usually by a range of sectors as a strategy to combat poverty in rural areas through linking capacity building and economic empowerment. For example in South Africa, the White Paper on Social Welfare advocates for developmental social welfare, which stresses empowering individuals and groups towards attaining self-reliance.

Department of Health, through a community based nutrition programme, and the Department of Agriculture through the activities of extension officers are also involved in community development and income generating projects, often with explicit nutrition and food security aims.

Non-governmental organizations (NGO's) also play a key role in community self-help initiatives. Many of those initiatives fail to contribute to sustainable poverty eradication because people implementing those initiatives are unaware or overlooking the knowledge that local people have concerning their resources and their approaches to food security (Agricultural Policy Unit, 1997: 28).

Loss and non-utilization of indigenous knowledge results in the insufficient allocation of resources and manpower to inappropriate development or planning strategies which have done little to alleviate rural poverty and food insecurity. Planning experts and government functionaries have attempted to implement programs, which do not meet the goals of local people or affect the structures and processes that perpetuate food insecurity.

Undermining traditional farmers' and local people's confidence in their indigenous knowledge to food security can lead them to become increasingly dependent on outside expertise and because these external inputs are expensive, poverty rates will always increase. Small-scale farmers are also often potrayed as backward, conservative, resistant to change, lacking innovative ability and even lazy (IFAP, 1990: 24).

Such perceptions are seen as results of,

- Lack of understanding of indigenous agriculture which further leads to a communication gap between promoters and practitioners and ultimately give rise to myths, and
- The accomplishment of indigenous farmers and local people are not recognized because they are not recorded in writing.

Agriculture, as a source of food in most developing countries, needs to be developed because it holds solutions to problems of food insecurity. Indigenous agriculture can ensure that food is accessible to those who are in need. It can generate local people's income through marketing of surplus products.

Through indigenous agricultural systems and indigenous approaches to food security poverty can be alleviated in developing countries, especially in rural areas.

1.6 HYPOTHESIS

Indigenous food production methods and measures used in the North West Province, Central and Eastern regions have ensured food security among different Batswana ethnic groups.

The role of indigenous knowledge systems in promoting food security tends to be overlooked in the North West Provincial government policy.

Indigenous communities in the North West Province, Central and Eastern regions encounter problems with regard to their agricultural production, i.e. in both crops and livestock.

1.7. SIGNIFICANCE OF THE STUDY

This study benefited the following: -

- The local people in Eastern and Central regions in terms of encouraging the establishment of agricultural policies that will preserve indigenous knowledge systems to food security and with ways to reduce their dependence on credits and external input supplies.
- Agricultural extension workers and researchers in making them aware of the role of indigenous knowledge systems to food security.
- The Department of Agriculture and Land Affairs, the Department of Social Services, Arts, Culture and Sports in terms of information on indigenous approaches to food security as an input to improve their food security programmes and policies.
- The University of North West, specifically the newly introduced course of Indigenous Knowledge Systems (IKS), with data on indigenous approaches and knowledge to food security among different Batswana ethnic groups in the North West Province, Eastern and Central regions.

1.8 METHODOLOGY

This was a comparative study of the indigenous approaches to food security among different Tswana ethnic groups in Central and Eastern regions in the North West Province. This study used both qualitative and quantitative research methods to investigate different indigenous approaches to food security among Batswana ethnic groups. Qualitative research methods such as interviews of elders and key persons in the study areas formed the core of the data collection methods. Questionnaires were also be used to collect quantitative data from the research sample. These two methods were used to ensure the validity of the data.

1.9 STUDY AREA

The Eastern and Central regions were selected because they are predominantly rural residences. This study is demarcated to investigate indigenous approaches to food security among these Batswana ethnic groups, i.e. Bakwena, Bahurutshe, Bakgatla and

Barolong. The villages selected were Moshana and Seweding in the Central region and Moruleng and Matlhako (Pella) in the Eastern region.

1.9 SUBJECTS

The following were the main sources of information for this study: -

Key Informants

-Extension workers

-Agricultural officers and researchers

-Traditional farmers

-Elders

-Traditional leaders

These were resource people for the study because extension workers and agricultural officers were well informed about existing food security approaches, policies and programmes and they know the problems encountered sometimes in the implementation of those food security policies and approaches. Traditional farmers were useful for this study because they normally use or follow traditional methods of food production and food security and they may produce more for subsistence and for the market. Elders are the custodians of indigenous knowledge (IK) so they know much about indigenous knowledge and approaches to food security.

Quantitative Informants

This included the following :-

Total Number Of Respondent Community Members is sixty.

Moruleng	(Bakgatla)	Male = 4; Female =11
Pella	(Bakwena)	Male =4; Female =11
Moshana	(Bahurutshe)	Male =7; Female =8
Seweding	(Barolong)	Male =5; Female =10

1.11 DATA COLLECTION METHODS

Two methods of data collection were used in this study.

-Questionnaires

They were used for collection of quantitative data such as the demographic data of respondents

-Interviews

Interviews were conducted with key persons in study areas. These were both face- to-face and through the telephone.

1.12 PROCEDURE

Letters of introduction were obtained from the Department of Sociology, University of North- West, informing key persons and traditional authorities about the objectives and methodology of the research. This was also to inform them about the researcher's cooperation with them in conducting the study, i.e. about days and times of visits and the selection of the sample.

1.13 DATA ANALYSIS

Content analysis was done on qualitative data. Qualitative data have a greater depth of the contents and usually presents a true story of people's experiences, attitudes and beliefs. Survey data from questionnaires, i.e. demographic data of respondents such as the age, marital status, educational background, etc, was quantified by subjecting them to descriptive statistical methods such as graphs, tables, etc.

1.14 ETHICAL CONSIDERATION

Respondents were treated with respect and courtesy. They were assured of complete anonymity and confidentiality. They were also informed that participation in the study is voluntary and that those who are interested in the study results will be promised a copy of the research report.

1.15 LIMITATIONS OF THE STUDY

Cooperation from the respondents was not possible as expected. Some elderly indigenous people were too old that they became short tempered to provide information. Some respondents were also feeling that the researcher is wasting their time. Transport to other study areas was a problem as the researcher could not reach the respondents at the right

time. All these constraints limited the study because the researcher had not get enough information as expected.

1.16 THEORETICAL PERSPECTIVE

The issues of food security, especially the approaches, have been in theory and practice perceived and conceptualized in different perspectives. This section discusses the various perspectives pertaining to indigenous food security strategies.

It is important to analyze indigenous approaches to food security from different perspectives because societies perceive food security in different perspectives.

FUNCTIONALISM

From the functionalist perspective, society is like an organism and every part of the organism must contribute to the maintenance and survival of the organism. Society also has basic needs or requirements, which must be met for its survival (Haralambos and Holborn, 1991: 764). Food is one of the basic needs needed for the survival of the society or members of society. Since food is the source of metabolic energy, the minimum requirement of the food system is to produce enough food to keep the family and society as a whole alive, the children growing and eventually reproducing society.

For instance, food security for the survival of the present and future generations has been one of the most important occupations of most indigenous communities. A number of local strategies were used. Every member of society in the basis of age and gender was expected to contribute to the food security of the community at both the household and community levels.

CONFLICT PERSPECTIVE

Conflict theories on food security argue against the functionalist approaches. They believe that there are fundamental differences of interests between social groups or members of any society. These differences are due to the existence of different classes, races and ethnic groups in societies. They lead to conflicts in preferences of food production and security approaches and technologies. Conflict perspectives to food

security further argue that it is the failure of society to allocate its resources fairly that explains the continued existence of food insecurity. They refer to the vulnerable as either unable to sell their labour or prevented from receiving necessary resources, for example employment, land, so that they can escape food insecurity and poverty. As a result of different interests of different ethnic groups, i.e. some ethnic groups preferring modern, some indigenous approaches to food production and security, conflict and confusion arise in society, which ultimately leads to environmental degradation. According to conflict theories to food security, food security means different things to different people (Prah, 1991: 2).

Globalization and other forms of imperialism have affected indigenous approaches to food production and security in developing countries. Globalization is the process whereby the population of the world is increasingly bonded into a single society (Gellner, 1993: 248). Biodiversity has tremendous implications for agriculture. The range of food resources has declined over time, although this trend has long been ignored. Miller (1995: 111) estimates that more than three thousands (3000) plant species have been used for food throughout human history, however there has been a significant reduction in variety. Now, most of the world's food comes from twenty (20) species.

This reduction is primarily a function of conquest and domination, which were usually associated with the suppression local crops and the introduction of exotic varieties, and plant breeding programs, which have focused on a narrow range of crops (Lang, 1996: 4).

Biodiversity or biological diversity refers to the variety of life on earth. The term encompasses three categories, i.e. genetic diversity, species diversity and ecosystem diversity. Many developing countries depend on agricultural products not just for food for their populations but also for a major portion of their foreign exchange earning. The biotechnology revolution in developing countries affected both their plant and livestock production. Before this revolution, technology and dissemination were carried out primarily by the public and patents and plant variety protection were generally not major issues. With this revolution, technology development and dissemination are primarily the province of the private sector, and processes and products are patentable and protectable.

The issue of patent is at the core of the debate over the equity issues related to germ plasm. Over time, farmers and scientists in the industrialized world have altered structures of plants through selective breeding. Consequently, researchers have looked at the Third World as the source of free primitive germ plasm. These genetic resources are used to produce genetically altered seeds for the international markets.

Since these are now patented and are private properties, they are sold back to Third World consumers. These genetically altered seeds often need expensive additives such as chemical fertilizers and pesticides, which are often environmentally as well as financially costly. The food security picture of developing countries deteriorates further when developing country farmers focus on hybrid varieties to the detriment of, and at the risk of causing disappearance of indigenous seed varieties (Yearley, 1996: 57).

THE LEGACY OF THE COLONIAL AGRICULTURAL POLICY

The colonial power destroyed indigenous food production and security systems by its primary economic task of integrating people in the colonies into the worldwide capital market. As most of the African colonies were considered essential sources of agricultural raw materials, this task basically compelled African population to produce those commodities required by the European industries, i.e. sisal, cotton, tea, etc. the method to attain this objective generally differed from colony to colony. In each colony, it was the colonial state that played a key role in the endeavours to subjugate the local inhabitants and integrate them into the world capital system. Laws, which destroyed indigenous food production and food security systems, were enacted compelling villagers to cultivate particular crops, i.e. cash crops, from which they have no profit or income rather than food crops. Socio- economic structures had been built in order to ensure a more permanent flow of agricultural raw materials from Africa to Western Europe and North America (Loewenson, 1992: 117).

Colonial agricultural strategy focused on commanding a surplus production from indigenous smallholders. Colonial authorities justified their strategy and the use of forced agricultural labour on the assumption that traditional farmers had surplus and extra labour time, which they spent on their subsistence farms. The colonial administration

also applied forced labour to keep down the costs of the French trading companies. Consequently, the food crop production of indigenous farmers decline precipitously. Faced by the demand to work in the commandants' fields, and to find money to pay taxes and other arbitrarily imposed dues, indigenous farmer used their reserve grain storks to cover household food shortfalls, ultimately in this situation they could not meet their needs.

From the beginning of mercantilism in the eighteenth century, Africa was characterized by slave trade, i.e. to supply the labour power which was to speed up the process of capital accumulation in the Atlantic Europe. Slave trade, apart from its other horrors, led to a regression of agricultural food production systems, thus increasing food insecurity and poverty in African states.

African states found themselves in a dilemma of economic development whose contrasted effects are even more explosive, i.e. rapid urbanization and mass unemployment, land shortage and agricultural stagnation, soil deterioration, famine and massive imports of food products, and the growing extemal dependence.

1.17 TENTATIVE ORGANIZATION OF THE FINAL REPORT

Chapter One is the introduction, including the background of the study, aims and objectives, methodology and the significance of the study.

Chapter Two gives the demographic data of respondent, such as their age, marital status, etc.

Chapter Three discusses indigenous food production methods and measures used by Batswana communities in Central and Eastern regions in the North- West Province.

Chapter Four shows the role of gender in the utilization of indigenous knowledge in food production in these communities to ensure sustainable food security.

Chapter Five discusses the problems encountered by different Batswana ethnic groups in the study areas in food production.

Chapter Six discusses the government policy towards the role of IKS in promoting food security and the assistance that the local communities in Central and Eastern regions get from the North- West Provincial government to ensure food security.

Chapter Seven provides conclusion and recommendations.

CHAPTER 2

THE DEMOGRAPHIC CHARACTERISTICS OF RESPONDENT COMMUNITY MEMBERS

The interest of this study was also on the examination of demographic characteristics of respondent community members in Central and Rustenburg regions particularly in Batswana ethnic groups of Bakgatla, Bakwena, Bahurutshe and Barolong. This included their age and sex structures, marital statuses, educational levels, religious affiliations, etc.

2.1 SEX AND AGE STRUCTIRES OF RESPONDENT COMMUNITY MEMBERS.

Gender and age are the two key dimensions of social relations in rural communities. These dimensions in rural areas also determine the division of labour in food production. Interviews with elderly people in the study areas indicated that elderly female community members are the custodians of indigenous knowledge to food security. Eighty percent (80%) of the elderly people interviewed are females. Table 2.1 shows the percentage distribution of gender and age structures of respondent community members.

TABLE 2.1. THE GENDER AND AGE STRUCTURES OF RESPONDENT COMMUNITY MEMBERS.

	RUSTENBURG REGION				CENTRAL REGION			
AGE GROUP	MORULENG		PELLA		MOSHANA		SEWEDING	
	M	F	M	F	M	F	M	F
< 30	0	0	0	0	0	0	0	0
31 - 40	0	0	0	0	0	0	20	10
41 - 50	0	28	50	45	86	50	0	20
51 - 60	75	36	50	45	14	50	40	40
61 >	25	36	0	10	0	0	40	30
TOTAL	100	100	100	100	100	100	100	100

The above table shows that in Moruleng seventy five percent (75%) of the female respondent community members were fifty -one years and above. In Moshana the figure for the male respondent community members between the age of forty-one and fifty years is eighty-six percent (86%). In Pella (Matlhako) there were both fifty percent of male respondent community members between forty- one years and fifty; and between fifty-one years and sixty. There is also forty-five percent of the female respondent community members between forty-one years and fifty, and fifty-one years and sixty in the same village, i.e. Pella. In Seweding the figure for both fifty-one years and above male respondent community members is forty percent and it is also forty percent for female respondent community members who are fifty-one years and above the same village.

2.2 MARITAL STATUS

Marriage is defined be Giddens (1997: 140) as a socially acknowledged and approved sexual union between two adult individuals. When two people marry they become kin to one another, the marriage bond also, however, connects together a wide range of kinspeople. Married people can also get divorced or separated due to their marital problems. Table 2.2 shows the percentage distribution of the marital status of respondent community members in Rustenburg and Central regions of the North West Province.

TABLE 2.2. PERCENTAGE DISTRIBUTION OF MARITAL STATUSES OF RESPONDENT COMMUNITY MEMBERS

	RUSTENBURG REGION				CENTRAL REGION			
MARITAL STATUS	MORULENG		PELLA		MOSHANA		SEWEDING	
	M	F	M	F	M	F	M	F
SINGLE	0	0	25	18	0	0	0	10
MARRIED	100	55	50	55	71	75	80	40
DIVORCED	0	0	0	0	0	12	0	10
SEPARATED	0	0	0	0	0	0	0	0
WIDOWED	0	45	25	27	29	13	20	40
TOTAL	100	100	100	100	100	100	100	100

Table 2.2 shows that hundred percent of male respondent community members in Moruleng (Rustenburg region) are married and fifty-five percent of the female respondents are females. In Pella fifty percent of males and fifty –five percent of females are married. Seventy-one percent of male and seventy-five percent of females in Moshana are also married. In Seweding males of the same status make eighty percent.

2.3. EDUCATIONAL STATUS

Education is the transition of knowledge from one generation to another by means of direct instruction. Although educational processes exist in all societies, it is only in the modern period that mass education takes the form of schooling, i.e. instructions in specialized educational environments in which individuals spend several years in their lives (Giddens,1997:582).

Table 2.3 shows the percentage distribution of the educational background of the respondent community members. Among the Batswana ethnic groups formal education

was not considered as much in the food production. These people were using their indigenous knowledge in food production, processing, storage, etc.

TABLE 2.3. PERCENTAGE DISTRIBUTION OF EDUCATIONAL BACKGROUND OF RESPONDENT COMMUNITY MEMBERS

	RUSTENBURG REGION				CENTRAL REGION			
EDUCATIONAL STATUS	MORULENG		PELLA		MOSHANA		SEWEDING	
	M	F	M	F	M	F	M	F
PRIMARY	0	18	25	9	0	0	20	30
MIDDLE	100	55	25	64	57	88	60	20
HIGH	0	0	0	0	0	0	0	0
TERTIARY	0	27	50	27	43	12	20	50
TOTAL	100	100	100	100	100	100	100	100

The above table shows that hundred of the male respondent community members in Moruleng attended middle school and the figure for the female respondent community members with the same educational level is fifty-five percent. In Pella sixty-four percent of the female respondent community members also attended middle school. Eighty-eight percent of the female respondents in Moshana also attended middle school.

2.4 RELIGIOUS AFFILIATION

Giddens (1997: 436) argued that religion involve a set of symbols, invoking feelings of reverence or awe, and are linked to rituals or ceremonies, such as church services, engaged in by a community of believers.

Religion is found in all societies functioning to maintain beliefs about forces that are considered supernatural and sacred to prescribe symbolic practices that are thought to be in harmony with the beliefs of the supernatural, and to link the community's established definitions of right and wrong behavior with the supernatural rewards and punishments. Religious experiences may include the awareness of belonging to a certain group of

believers. Rituals often remind the individual of this belonging, creating an intense sense of togetherness (Mc Guire, 1992: 20). Table 2.4 shows the percentage distribution of religious affiliations of respondent community members in Central and Rustenburg regions.

TABLE 2.4. PERCENTAGE DISTRIBUTION OF RELIGIOUS AFFILIATIONS OF RESPONDENT COMMUNITY MEMBERS

	RUSTENBURG REGION				CENTRAL REGION			
Religious affiliation	MORULENG		PELLA		MOSHANA		SEWEDING	
	M	F	M	F	M	F	M	F
Christian	75	73	75	64	86	62	100	70
Apostolic	0	27	0	27	14	38	0	20
Catholic	25	0	25	9	0	0	0	10
Any Other	0	0	0	0	0	0	0	0
TOTAL	100	100	100	100	100	100	100	100

Religion plays an important part among the Batswana people. Like other African people, Batswana people believe in God. He is believed to be the creater of the earth. The Batswana , like Ngunis and other Africans, believe that the spirits of the ancestors (the spirits of dead Batswana) could give or deliver their prayers to the God. These spirits are called "Badimo" in Setswana.

The above table shows that most of the people in the study areas are Christians. In Moruleng seventy-five percent of the male respondents and seventy-three percent of the female respondent community members are Christians. In Pella figures for respondent community members who are Christians are seventy-five percent males and sixty-four percent females. In Central region, Moshana village eighty-six percent male respondent community members and sixty-two percent females are Christians and also in Seweding hundred percent males and seventy percent females are also Christians.

2.5 NUMBER OF FAMILY MEMBERS

Table 2.5 shows the percentage distribution of number of family members. This was done to understand whether the number of family members in the Batswana families affect their household food security. This was also to investigate whether the Batswana families are either nuclear or extended.

TABLE 2.5. PERCENTAGE DISTRIBUTION OF NUMBER OF FAMILY MEMBERS IN THE RESPONDENTS' HOUSEHOLDS

	RUSTENBURG REGION				CENTRAL REGION			
no. of family members	MORULENG		PELLA		MOSHANA		SEWEDING	
	M	F	M	F	M	F	M	F
< 3	0	9	25	0	14	12	0	0
3 - 7	25	55	25	91	72	38	20	30
8 - 12	75	9	50	0	14	50	40	40
12 >	0	25	0	9	0	0	40	30
TOTAL	100	100	100	100	100	100	100	100

The above table shows that in Moruleng seventy-five percent of the male respondent community members have eight to twelve family members in their households, while fifty-five percent of the female respondents have three to seven family members. In Pella, ninety-one percent of the female respondents also have three to seven members in their families and fifty percent of the male respondents have eight to twelve family members. However, seventy-two percent of the respondent community members in Moshana have three to seven members in their families and fifty percent of the female respondents have eight to twelve members. In Seweding forty percent of both males and females have eight to twelve members in their families. Most of the families in the study areas are extended families. According to interviewed elders in the study areas the number of their family member did not affect their food security. Having a larger family was a blessing to them.

CHAPTER 3

INDIGENOUS FOOD PRODUCTION METHODS AND MEASURES

The aim of this chapter is to show how traditional farmers and indigenous people in the study areas have evolved complex food production systems to ensure food security and to demonstrate that professional agriculturalists, and particularly scientists, should spend more time talking and most importantly listening to local farmers. A better understanding of events on traditional farmer's fields and of the place of the farm in the overall rural economy would improve scientists' awareness of farmers' requirements, increasing food security in the province, and in the country as a whole.

The emphasis of this chapter is on the complexity of indigenous food production methods and the cropping systems. This will begin with describing the complexity of indigenous food production methods and measures, illustrating this with reference to examples drawn from different Batswana ethnic groups, i.e. Bakgatla, Bakwena, Bahurutshe and Barolong in the Rustenburg and Central regions of the North West Province.

3.1. BATSWANA FOOD PRODUCTION SYSTEMS

Batswana farming is mainly to provide food, raw material and shelter, and to produce a surplus with which to obtain, by various reciprocity arrangements, goods and materials not produced on the farm. This is also to maintain status and acquire more property and to meet obligations in respect of religious festivals and other traditional rites.

The Batswana indigenous farming systems basically consist of subsistence holdings in two locations. These are the compound land and the distant or outer farms. The number of holdings per farming household ranges from two to six, comprising the compound and the outer farmland. The compound land lies in the immediate surrounding of the house and benefits from kraal manure, which is also extended to the outer farm. Because a

relatively high level of fertility is maintained, the outer farmland is usually few kilometers from the village and generally larger in size.

3.2. THE COMPLEXITY OF INDIGENOUS FOOD PRODUCTION METHODS

Batswana farmers have evolved food production practices which are highly divers and far from static. They have acquired a fund of knowledge on the production and utilization of a wide range of food crop species. Rarely do traditional farmers' fields contain only one crop, they are either mixed or planted on separate parts of the field. Their fields represent a complex of species, which provide them with their basic requirements, i.e. food and income throughout the year.

Food crop production is not the only component of the Batswana food security system. Livestock make an equal important contribution food security in the study areas. In some households in the study areas livestock assume a dominant role in meeting subsistence needs, while crop production is a subsidiary enterprise. In places such as Moshana, Central region, and Moruleng and Pella, Rustenburg region, crop production meet most of the household subsistence requirements and livestock play an important role as a source of cash income.

3.2.1. MULTIPLE CROPPING SYSTEM

Food crop production in the study areas is based on the association of varying complexity, rather than on the mono-cropping characteristic of mechanized production in more developed agricultural economies. Rowland (1993: 96) outlined that agronomists and social scientists have come to understand both the biological and the economic advantages of multiple cropping. At the same time there has been increasing awareness of the problems cited by local farmers in trying to follow the advices typically given by extensionalists. Multiple cropping practiced by local farmers in the study areas seem to be sustainable in the absence of inputs such as chemical fertilizers, pesticides, etc.

The importance attached to different crops in the study areas varies between households, but also according to the nature of the season. People in areas like Moruleng regard maize

grain as important while in some places such as Moshana they plant or consider sorghum mostly. The same applies to the way in which specific crops are planted and managed. Despite the number of species grown, several cultivars of each species are available, increasing the flexibility of the cropping. Futhermore, flexibility is achieved by altering the mix of species according to changing climatic circumstances.

The most popular mixes are :-

*sorghum + sweet reed + beans + pumpkins + calabashes

*maize + sweet reed + beans + pumpkins + calabashes

Sweet reed is a sorghum grown for the sugar content of its stem. In Setswana it is called "nptswe" or "nngoba". Mixing minor crops, for example beans, pumpkins, etc, (dijalo tsa tlase) and major crops, eg. maize, sorghum, sweet reed, means that they can be planted over a number of days. Mixing is also the simplest way of incorporating crops, which ensure variability within the household diet without preparing extra land. Complexity of cropping created by Batswana people in the study areas by using different species of the same crop.

For example,

types of sorghum :- tonokopo ,segaolane, letsipe
sebethane, mabele a a mashibidu
lebelebele, tshaba- tsie
manjakane, lethejane

types of beans :- ditlhodi, ditloo
mae-a-tshilwana, kgopolanare

dithotse :- pumpkins, calabashes, melons, cucumber

calabashes :- makgomane, makatane, digo

3.2.1.1. ADVANTAGES OF MULTIPLE CROPPING

According to interviewed key persons in the study areas such as elders, farmers ,etc. multiple cropping system reflect the farmers' multiple objectives, including their need to survive. The complexity of the system in time and space confers both the biological, social and economic advantages.

The advantages are as follows :-

- More effective use of land. Total yields from mixed cropping systems are usually higher than those obtained from growing the same crop on their own, taking into account the additional area of land saved.
- Greater yields stability. Batswana farmers in the study areas regard multiple cropping as resulting in more stable yields than those in mono-cropping. To them, diversification provides greater protection against the risk of drought, pests and disease with the result of if one crop is less successful the other one is usually more so.
- Spreading of labour inputs. Interviewed informants outlined that multiple cropping enable the farmer to organize tasks in a steady and manageable sequence.
- Supply of greater diversity of food production over a longer period and hence better nutrition for the family.
- Soil and water conservation, protecting the natural resource base and so providing a more sustainable basis for production over a long term.
- More opportunity to market surpluses of a greater range of products, increasing cash income for different family members.

3.2.2. SHIFTING CULTIVATION

Shifting cultivation, also called swidden agriculture, has been and still practiced by Batswana communities in the study areas to manage soil fertility. Shifting cultivation involves an alternation between crops and long-term forest fallows. When a farming season arrives, forest is cut and burnt to clear the land and provide ash as fertilizer for the soil and as a way of controlling weeds and pests.

Through this system crop yields are high for the first years bit then fall on account of declining soil fertility or invasion of weeds and pests. The field is then abandoned and the farmer will clear another piece of land. The abandoned field is then left to fallow for several years and to have a chance to rebuild fertility before the farmer can return to it and start the process again.

Shifting cultivation is often characterized by a season-to-season progression of different crops which differs in soil nutrient requirement and succeptibility to weeds and pests. Shifting cultivation practiced throughout the world vary immensely but integral systems of shifting cultivation are the ones practiced by Batswana people in Central and Rustenburg regions. Integral system stem from a more traditional, year-round community wide and large self-containing way of life. This system represents a good equilibrium between humans and their environment.

3.2.3. ANIMAL DRAFT POWER

According to interviewed key persons in the study areas the use of animal draft power in performing farm operations was identified as an appropriate technology for decades for bigger farms as an alternative of farming operations on small farms which was done manually with a hoe. As a power source to supplement or replace human power, the use of animal draft power which is widely referred to as animal traction, has benefited traditional farmers in the study areas by increasing labour productivity, allowing seasonal bottlenecks to be overcomed and increasing yields.

3.2.3.1. OXEN VERSUS DONKEY DRAFT POWER

Donkey and oxen based system have similar performance rates for weeding, but oxen have a definite advantage for ploughing which is more power intensive. Traditional farmers interviewed at Moruleng and Moshana rated ox team seventy-five percent (75%) faster than a donkey team. Care and maintenance is easier and less costly for donkeys than for an ox team.

3.2.3.2. ADVANTAGES OF ANIMAL TRACTION

The advantages of the animal draft power are as follows :-

- Deep tillage before planting results in better plant development and increased yields due to loosening of the soil as well as better water infiltration and retention.
- Increased labour productivity allows the acreage cultivated by a household to be increased.
- This improves soil fertility and ultimately increases yields because the use of animals in the farm increases the application of draft animal manure.
- The time required for weeding is reduced by using animal traction equipment as the use of these plough before planting reduces or retard weed growth.

3.3. SOWING PATTERNS AMONG BATSWANA ETHNIC GROUPS

Seeds are first mixed together then scattered on the land prior to ploughing in. The result is a random mix of crops. A random mix of this nature is referred to as mixed cropping to distinguish it from planting alternative rows of different crops which is often referred to as inter-cropping

3.4. ORGANIZATION OF FOOD PRODUCTION ACTIVITIES

Food production activities among the Batswana people in Central and Rustenburg regions start with the ploughing season in August. This is after the first rains of their farming year. This rain in Setswana is called Tsheola or Sephai. During August to September kraal manure from cattle, goats and sheep is scattered throughout the fields in preparation for the planting.

The chief would then call for a sacred ceremony to bless the seeds. Old women and young girls (clean girls, i.e. virgins) dressed up in traditional clothes will carry water from the river to the chief's kraal. This is one of the ways of rainmaking among the Batswana ethnic groups. The custodian of the ritual in the form of the tribal traditional doctor then performs an environmental cleansing ceremony. The traditional doctor will continue the ritual after which he lead the community to the veld to collect all the rubbish to be burnt, either in the chief's kraal or in the field/bush.

In Moruleng, Rustenburg region, according to interviewed informants, 'mogaga' is used to pray for rain. This is a traditional herb used to clean the bush if there is no rain and there are doubts that there might be some evil spirits that cause shortage of rain. Boys are instructed to go to the bush to burn all alien plants, i.e. 'motenakolobe' and 'mokolonyane', and all dead animals that might be there in the bush and not seen by anyone. After doing this they spread a mixture of mogaga and water in the bush. On their return it will be raining.

The planting process will then start as soon as after the rain falls. This process will carry on until December and January. Because multiple cropping is a conscious process, every household of Motswana plants a variety of seeds. In February, when the seeds have already grown, then the Batswana women and girls start a process of picking beans and pumpkin leaves to preserve dried green vegetables, which they call 'morogo'. This continues until the fruits of that particular plant appear. Batswana people in Central and Rustenburg regions also pick leaves of veld plants such as 'thepe' and 'rotho' to make 'morogo'.

CHAPTER 4

THE ROLE OF GENDER IN THE UTILIZATION OF INDIGENOUS KNOWLEDGE IN FOOD PRODUCTION AND SECURITY

The position of women in South Africa is one which has been profoundly affected by colonialism, capitalism, not forgetting apartheid. Black women in rural areas have been discriminated more than any other section of the population. Women's identity in the rural areas is still closely linked to a male, i.e. a father, a husband or a son. Many rural women are still completely dependent on them for their support. Understanding rural women's attempts to organize effective strategies for survival are central to an understanding of the development process. Yet, until recently, women have been ignored in the development theory.

Feminists make a natural contribution to rural development as to issues such as supplying people with basic needs, i.e. food, water, shelter, health and education. Women are directly responsible for meeting these needs (Murphy, 1991: 75).

4.1. TRADITIONAL ROLES IN FOOD PRODUCTION

Batswana women in the study areas have played a significant role traditional agricultural production and technology in their societies. Because their contribution was so central in both food production and security, traditional structures of resource allocation did provide them access to the basic factors of production in agriculture. Despite the fact that they remained socially subordinate to men, they also participate in resource control and production.

Women form the backbone of the agricultural economy. Women in Central and Rustenburg regions of the North West Province do not just sit home and wait for their spouses to bring products for household use, they are farmers themselves who produce adequate food for their families.

In different Batswana ethnic groups in Central and Rustenburg regions, I found that women have a significant responsibility for farming. They do almost all the farming work, except clearing the land. Women produce sixty to eighty percent of the food in most developing countries and they are responsible for half of the world's food production, yet their role as food producers and providers, and their critical contribution to the household food security is only recently becoming recognized (SDWW, 2000: 1).

Batswana women in the study areas are also engaged in food processing and storage. They had high levels of participation in their household agricultural output marketing. Among different Batswana ethnic groups in Central and Rustenburg region this activity is considered more of a female than a male. Batswana woman are engaged in agricultural production marketing in several ways. First, as private traders, whose chief source of income is trading. Second, as stallholders in village or town markets. Third, as the person in the household farm chiefly responsible for selling selected or all the output. Fourth, as the processor of the farm output prior to their consumption or sale in the market.

Other factors also may have accentuated the contribution of rural women to food production. Colonial policies of drawing men away from villages and the emphasis on mining and the production of export or cash crops drew women more into the production of food supply.

4.2. THE IMPACT OF TECHNOLOGY CHANGE ON BATSWANA WOMEN IN CENTRAL AND RUSTENBURG REGIONS

The rapid modernization of agriculture and the introduction of new technologies such as those characterizes the Green Revolution have a differential impact on rural population by both class and gender. How the Green Revolution affected rural people depended on whether they are wage earners, cultivators or consumers, whether they are rich or poor, male or female heads of households (WDS, 2000: 1).

The introduction of high yielding varieties of seeds has had a major impact on rural women in the study areas, especially on their work and employment. This have increased

their needs for household cash income which also include covering the costs of technological inputs. Some of interviewed women in the study areas pointed out that they are now forced to work as agricultural labourers and they lost their traditional roles as farmers who used to produce food for their families.

4.3. THE UTILIZATION OF INDIGENOUS KNOWLEDGE

When man decides to use an area of land to produce food for himself and his family he inevitably disturbs the balance of the selfish genes of all species, and he tends to regard biological competitors for such land as his enemies. Weeds, pests and diseases are the three components of successful agricultural output and productivity. Weeds and pests are types of living organisms unwanted by the farmer because they compete with, or directly injure, the commodities he is trying to produce.

4.3.1. WEED, PEST AND DESEASE CONTROL

The effects of the weeds on the crop yields tend to be more consistent than those of pests and disease, but even so there is much variation in losses. The weed population changes in multitude from site to site according to weather, soil conditions and the timing of cultivation. Acid soils have a different selection of weed species from those in alkaline soils. The weed pattern also change in response to variation in soil moisture, soil fertility, altitude, temperature and exposure. The number and type of weeds also vary in accordance with previous history and crop pattern of the site.

The degree with which they will compete with the crops is also determined by the current weather. Weeds usually the greatest depression of final crop yields if they develop rapidly before the crop itself if fully established. If they develop before the crop is sown or planted out, there is an opportunity to destroy them without causing injury to the crop. If they develop at a late stage after the crop is well established and is growing freely, then they compete less effectively and may cause little loss of final crop yields.

The control of biotic factors damaging the crop plant is of greater practical importance. To secure control of these biotic population knowledge of lifecycle and how to break

them is essential. But the management of these in agricultural fields with herbicides and pesticides is under scrutiny because of off -target herbicides and pesticides effects, primarily ground and surface water contamination.

Interviewed key informants in the study areas indicated that they control weeds and pests through integrated use of crop rotation, competitive crops and tillage. Physical measures at well-chosen times also control weeds. These include stubble cultivation, hoeing earlier of the fields and heavy shading by some crops. With increased use of herbicides and pesticides, they also outlined that the use of these methods have declined. They also use 'letsema' in hoeing to take out weeds.

4.3.2. SOIL FERTILITY MANAGEMENT

The principal objective of any cropping practice and soil management program is sustainable profitable production, and for increased food production there must be sustainable soil fertility management. Soil conservation is essentially for good soil management and embraces more than just the prevention of soil losses. Soil erosion is a symptom of poor soil management but not a primary cause of soil destruction.

Among different Batswana ethnic groups in the study areas soil fertility is maintained through kraal manure. Kraal manure is still a mainstay in the soil fertility programs in Central and Rustenburg regions. Interviewed informants also outlined that they manage soil fertility through their cropping systems, i.e. multiple cropping, crop rotation and shifting cultivation.

4.3.3. HARVESTING

Batswana communities in Central and Rustenburg regions, as stated by interviewed respondents, normally use ' letsema' to harvest their fields. In this method a farmer make an invitation to a group of villagers who will help him or her in harvesting. This may be formed by relatives only or a combination of this with other members of the community. In terms of extended families, the farmer takes his or her family to help.

Before 'letsema' can get into the field, the farmer must prepare traditional beer and food, i.e. 'kabu' or 'dikgobe'. It is not always that 'letsema' is paid. According to one of the interviewed elders in Moshana, this depends on the harvested output level. They also do not regard this as payment. To them it is only to thank the helpers. The members are usually given a certain amount of the output. During the harvesting process women prepare mud floors to thrash the corns. These floors are called 'diboana' in Setswana.

4.3.4. FOOD STORAGE

To store food Batswana women also build large mud house-like grain storages. These are called 'difalana' by Batswana people in the study areas. They build these in such a way that it have a window-like opening from which they can be able to take out the grains for food preparation. At Moshana and Pella they bild these inside a mud hut, and at Moruleng the informers pointed out that they build theirs' outside in the household backyard and it is roofed. The grains stored in 'sefalana' stays in it until the next harvesting season.

To prevent pests from destroying stored grains Batswana people in Central and Rustenburg regions use ash. To their experience pests do not survive in ash and it is harmless to their bodies. They just pour the ash straight into the grain before storage. In Moruleng they indicated that they use the ash of 'Motswere' tree.

Beans are stored in bags. Some of the interviewees in Moshana village pointed out that they store their pumpkins on top of their huts, the aim as to expose them to the sun so that they become strong and nutritious. Through this their seeds will be able to survive pests.

To ensure food supply for the future the Batswana women have different cooking methods for their families. The cook green mielies in big pots and dried. These will be stored away in big clay pots ('ditsaga') or in bags for future consumption. This method of preservation controls pests. The household can re-cook the preserved food whenever it is needed. Batswana women in the study areas also pointed out that they also prepare a meal of sorghum grain which is not stamped called 'mosutlhane'. They also sometimes

prepare a meal of sorghum cooked with milk which they call 'legala', and another one with sour milk called 'sebube' (Ntsime, 1993: 47).

Processing grain among different Batswana ethnic groups in Central and Rustenburg regions are through grinding stones and stamping blocks. To them this is also a way of getting a variety of products from a whole embryo meal rich in proteins, oil and mineral salts to feed their young ones and the whole family.

Among the Batswana people in the study areas when a cattle, sheep or a goat is slaughtered different body parts are separated according to their tradition.
There are also parts which are consumed in accordance to gender and age. For example, 'ngati'.

After separating parts meat is cooked in big pots and dried on the sun to make 'mokungwana'. This was their only method, as they did not have refrigerators. Biltongs were also made for future consumption.

4.4. THE ROLE OF WILDLIFE TO BATSWANA ETHNIC GROUPS IN ENSURING FOOD SECURITY

Natural resources, i.e. animals and vegetation play a significant role in ensuring food security for Batswana people. As they are traditionally hunters, they also depend on some wild animals for meat. There are some animals which are hunted such as rabbits, etc. Other animals are protected from being hunted by the Batswana traditional belief in totems.

In plants, Batswana ethnic groups have some trees from which they get fruits. The wild fruit trees in Rustenburg and Central regions are 'morula, moretologa, moretlwa, motlhatswa, moshabele, mokgalo, mmupudu and morobe'. Some of these trees also help or are used by Batswana men in the study areas in crafting their traditional equipments. For example Morula tree for its is used for traditional basins, i.e. 'megojwana'. Mosetlha and mokgalo trees are used for stamping blocks, i.e. 'dikika' and 'metshe'.

Batswana people in the study areas also use other wild plants as green vegetables (morogo). Those are 'thepe' and 'rotho'. The leaves of these are the ones which are picked to make the vegetable. Other wild onion-like vegetables in Moshana are 'seanyane', 'tlhoruma', (these are eaten to quench thirst), 'dirowa', 'ditshuge' and 'lebowa'.

CHAPTER 5

PROBLEMS ENCOUNTERED BY BATSWANA PEOPLE IN THE STUDY AREAS IN FOOD SECURITY

Throughout most developing countries the intensity of agriculture and greater land utilization and food production is broadly associated with higher population density. Against this generality, however, are many instances in which the intensification process has not to the type of adjustments in agriculture that improves food availability in rural areas or general quality of well being. Given the seeming inevitability of rapid population growth in South Africa, especially now in urban areas, it is particularly important to understand those situations that lead to positive intensification in rural areas, i.e. improving food supply and people's wellbeing and practicing sustainable agriculture. This chapter looks at the problems experienced by Batswana ethnic groups in the study areas in terms of improving their food supply situations.

5.1. SEEDS

Seeds are living bodies containing embryo plants together with enough concentrated food to give them a good start in life until they can obtain food for themselves (Turner, et. al, 1993: 1). Many seed s contain valuable food and Batswana people use a great variety of seeds to feed themselves and their animals, for example, sorghum, maize, beans, etc.

A seed has a skin or coat called testa. Towards the thicker end there is a blackish mark called hilum which is the scar where it attached to the pod or ovary. At the end of the hilum is a small hole called the micropyle. Plants whose seeds have two seed leaves, eg. beans, are called dicotyledons. Their leaves are broad. Other kinds of plants which have long narrow leaves are called monocotyledons, eg. Maize. Cotyledon or a seed leave is a store of food on which a young plant can live until it has developed sufficiently to find its own food (Abbott, 1992: 158).

Many Batswana farmers experience problems with the modern varieties of seeds. These modern varieties are essentially high-response varieties. They are bred to respond to high dose of chemical fertilizers.

According to interviewed informants in the study areas their problems with these seeds is that they do not have enough money to buy new seeds every season. They also outlined that these seeds need high nutrients, high water supply and adequate pest control. If these conditions are not quaranteed, risks of yield losses become higher than with local varieties.

To other interviewed elders in the study areas promotion of modern varieties of seeds have let to the disappearance of many indigenous varieties. This spelled disasters for local farmers, and for the community as a whole, to produce their crops with internal inputs, for both for economic and ecological reasons.

5.2. THE IMPLICATIONS OF GENETIC ENGENEERING ON SUSTAINABLE AGRICULTURE AND FOOD SUPPLY

Modern agricultural development is focused mostly on herbicides and pesticides resistance, not on aspects like drought resistance varieties that could make a real contribution to food security in rural areas. Genetic developments are almost controlled by private sectors focusing on profitable commodities that create greater control of food production.

Patent claims on genes and seeds manipulated by corporations means traditional free access and that exchange among farmer is blocked. This made them dependent on commercial interest for their survival. It also creates food insecurity for the poor who cannot afford to buy new seeds each and every farming season. This situation does nothing to alter other social and economic reasons for the rural hunger.

Genetic engineering is known to have unpredictable effects on the genetic make-up of organisms. Inserting into the food chain gene from organisms which have never been

eaten by human being introduces new uncertainties into food. Allergies and other toxic effects can occur.

5.3. THE VALUE OF GENETIC ENGINEERING AS COMPARED TO TRADITIONAL AGRICULTURE

Cross-pollination or gene transference from genetic engineered crops potentially threatens the livelihoods of traditional farmers. Genetic engineered food and patenting threatens food security by reducing the diversity of crops grown and the control of farmer and local people over their historical or indigenous choice of food and crops.

Mono-cropping and the industrial agriculture that genetic engineering encourages has historically caused increased urbanization, as rural people are moving to look for jobs in urban areas. Lastly, there has been a marked decline in the biodiversity and biological health of the soil and environment where industrial chemicals have been practiced.

5.4. LIVESTOCK KEEPING BY BATSWANA ETHNIC GROUPS

Overgrazing has been pointed as another sure way to ruin marginal lands. As another problem experienced by Batswana communities in the study areas, overgrazing means too many livestock on the land. We must learn that normadic pastoralists have traditionally made effective use of vast stretches of semi-arid land that otherwise would have remained unproductive. While their migration might look random to people who do not know, they are in reality patterned to take advantage of variation in rainfall and vegetation.

Pastoralism practiced by the Batswana people in the study areas is then a rational response an environment characterized by the scarcity of water, seasonal drought and widely scattered seasonal fodder resources. The pastoralists' tactics made use of resources that other people, like scientists, would not even consider as resources.

Another indigenous livestock technique by Batswana pastoralists is keeping a herd that consists of different types of livestock, i.e. cattle, sheep, goats, donkeys. Cattle and sheep

graze on grassland while goats browse on shrubs and low parts of trees. Valuable proteins for human consumption are thus produced by plants eaten by livestock that humans cannot eat. Different species also have different reproductive cycles, staggered breeding seasons which ensure types of milk throughout the year.

The hardiness of goats made them good animals for Batswana people to fall back on in times of drought when cattle and sheep die off. A varied herd also acts as a walking storehouse for food to different Batswana ethnic groups, either directly in terms of milk and meat or indirectly in exchange for grain. In exchange for grain to farmers, the pastoralist produced enough meat and dairy products. In addition, their herds annually manure the fallow fields for farmers. The animals thus gain good grazing land and the fertility of the farmers' soils improves. This symbiotic relationship as practiced by different Batswana ethnic groups in the study areas allowed for remarkably dense population to confortably inhabit seemingly in hospitable land.

Raising livestock by Batswana ethnic groups has been an excellent way to make marginal lands productive, but the problem of overgrazing is still encountered. This problem came with the French colonial administration which created arbitrary national borders. Due to shortage of land for black people during the apartheid era, there is an increasing difficulty for Batswana people in shifting their herds in response to the short- and long-term cycle of nature.

5.5. THE IMPORTANCE OF LIVESTOCK TO BATSWANA

Agricultural animals such as cattle, goats, chickens, etc. play an important role to Batswana people in ensuring food security. These animals are also used for transport, especially over difficult terrain, and they provide the power for cultivation. Agricultural animals provide a great variety of products, but the majority is kept for food.

The animals are also ecologically necessary to maintain soil fertility. Finally, they have cultural significance to different Batswana ethnic groups. They represent wealth and necessary for celebrations and ceremonies. Attitude to animals thus vary greatly across the world and this affects the way they are treated (Spedding, 1996: 78).

5.6. POPULATION GROWTH AND FOOD SUPPLIES

Food security is an imprecise concept for classifying population according to their vulnerability to hunger and food shortages. It can be defined at various levels with regard to individual, households or large populations. In this context it can be taken to refer to the populations' capacity to obtain adequate qualities of food with reasonable degree of assurance. Household food security can depend upon factors like age composition of family members. Their health status, employment prospects and the prices of food, and agricultural conditions that the household confronts (Dyson, 1996: 7).

Interest in the relationship between population and food, and in particular anxiety about the balance of this relationship, is far from new. Any assessment for the future prospects for this relationship can undoubtedly profit from a close examination of the past trends and the current situation. The future may be uncertain, but for different Batswana ethnic groups as they learn from their indigenous knowledge they pointed out that the number of family members do not affect their food production.

This relationship of food and population involves explicit recognition of the fact that social and economic inequality often determines differences in people's access to food in the country (Turner, et al., 1993). Moreover, we can consider the multitude of way in which people obtain their food today. At one extreme, many poor households in the study areas still depend directly on their indigenous approaches to food production, i.e. on their own labour to cultivate, fish, hunt the bulk of food they eat. At the other extreme, minority of the study communities had virtually no contact with their original source of food. Instead, a trip to the local supermarket is sufficient to reveal a huge diversity of food stuffs from any location, transported to them and mediated by a vast complicated system of the international trade.

The destruction of our global ecosystem and its agricultural resources coincides with an increase in the population of human being and livestock. Much of this began with colonialism. The plantation established by the British, Spanish and other colonial power put a double burden on the land. First, they expropriated the best land for continuous

cultivation of crops for export. Second, they usually pushed local farmers into marginal, often hilly land not at all suitable for intensive farming. Land that otherwise might have served for grazing, forestry or recreation soon became ravaged by erosion.

CHAPTER SIX

GOVERNMENT POLICIES TOWARDS THE ROLE OF INDIGENOUS KNOWLEDGE ON FOOD SECURITY AND THE ASSISTANCE THAT THE STUDY COMMUNITIES GET FROM THE GOVERNMENT TO ENSURE FOOD SECURITY

In May 1994, the government passed an agricultural policy which its main objectives were, first to ensure that all rural people in South Africa are able to establish and maintain a life of quality by improving access to sufficient food, infrastructure, services and resources for production and jobs with equitable conditions of employment and resources for production. Secondly, to introduce policies designed to support the establishment of a small farmer sector that will provide access land and agricultural resources for those historically excluded, with appropriate training and extension.

Thirdly, to ensure that farming systems, and the intensive that drive them, are economically and socially sustainable and based on sound environmental principles. Lastly, to establish a regulatory framework which protects the health, safety and information requirements of consumers, producers and workers without imposing unnecessary controls and restrictions on producers (ANC Agricultural Policy, 1994).

Hence, most people in urban and rural South Africa are net food purchasers. Policies ensuring affordable and stable food prices are therefore crucial. The pursuit of self-sufficiency has failed to end hunger and malnutrition in the country. The ANC Agricultural policy is aimed to ensure that national food requirements are met by the most efficient combination of domestic production and trade that is consistent with broader targets for economic growth, employment and agricultural structuring. However, household food security, to this policy, is enhanced by a range of measures to improve the affordability of food. These include VAT exemption on basic foods, as well as measures to raise income such as public works progammes, improved welfare provision, and the development of the thriving rural economy.

The country's agricultural policy is more concentrated on the industrialized agriculture and the provision of credits to farmers. This seems that they are not aware of the role of indigenous knowledge on food security. Indigenous knowledge have played a significant role among different Batswana ethnic groups in the Central and Rustenburg regions in ensuring their food security.

Some respondent community members indicated that they sometimes get fertilizers from the agricultural offices. They also pointed out that even though there are some help that they get from the government, their problems in following those help is that they have no access to enough land where they can use them. Interviewed informants also stated that extension workers who give them advices do not want to understand their local ways of food production.

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

The study draws its conclusion on a number of observations and makes recommendations to that effect. Gender differences played a considerable role in role allocation, division of labour and power relation within the two respondent communities. The female respondent members of the communities constitute an active larger portion as custodians of indigenous knowledge to food security. Furthermore to this is the colonial policies, which drew men away from villages and emphasized on mining and the production of export or cash crops drew more women into the programmes of food security. The study observed that the elderly members of both research communities are knowledgeable and skilled in areas of indigenous technology that contribute directly to food security and processing within their communities.

The study found that most of the respondents were married and thereby shared knowledge from their tradition about the indigenous, ecological and related skills that were needed for life long sustenance. Formal education played an important role in providing skills and training needed for individuals to engage in modern systems of food security.

The study found that Batswana farmers had evolved food production practices which are highly divers and far from static. They have acquired a fund of knowledge on the production and utilization of a wide range of food crop species. Rarely do traditional farmers' fields contain only one crop, they are either mixed or planted on separate parts of the field. Their fields represent a complex of species, which provide them with their basic requirements, i.e. food and income throughout the year.

Interviewed key persons in the study areas indicated that multiple cropping system reflect the farmers' multiple objectives, including their need to survive. The complexity of the system in time and space confers both the biological, social and economic advantages.

The study observed the following advantages of multiple cropping as a form of food security: it provide more effective land use; greater yields of stability; spreading of labour inputs; provide a greater diversity of food production over a longer period, protection of natural resources base and thus provide a more sustainable basis for production over a long term.

Bakgatla, Bakwena, Barolong and Bahurutshe from the study areas used soil fertility management systems , harvesting and food storage in a hybrid way i.e. they incorporated exogenous ways into their local systems to yield production and increase food security methods. This includes the utilization of wildlife ranging from natural resources e.g. vegetation and animal remains. These communities used the same methods and measures of food production. Their crop production methods are biologically successful because there is a good use of the wide variety of natural endowments of the climate and soil.

The study found out that there is no policy, law or regulation that facilitate indigenous food security in the Province. Local knowledge that resides in the memories of elders in the study communities is disappearing without being acknowledged by both government and its agencies in charge of development. The challenges of such a loss is far greater a damage that it can be thought.

The study recommends that the government should formulate policies that will indicate their use of indigenous knowledge in food security. This will help local communities to control their seeds and crops, and also make them save their indigenous species of crops. This study goes further to recommend that the study communities should be encouraged to use their indigenous equipment for agricultural production.

Unless indigenous food security becomes part and parcels of curriculum a lot of traditional knowledge will be lost. This study therefore recommends further research in areas of sustainable utilization of indigenous technology, knowledge related aspects of food security in rural areas as part of an integrated rural development strategy.

ANNEXTURE A

QUESTIONNAIRE FOR ADULT CUMMUNITY MEMBERS

TOPIC: A COMPARATIVE STUDY OF INDIGENOUS APPROACHES TO FOOD SECURITY AMONG DIFFERENT BATSWANA ETHNIC GROUPS IN THE NORTH WEST PROVINCE: CASES FROM EASTERN AND CENTRAL REGIONS.

OBJECTIVES:

- INDIGENOUS FOOD PRODUCTION METHODS AND MEASURES USED BY BATSWANA COMMUNITIES IN CENTRAL AND CENTRAL REGIONS IN TERMS OF FIELD CULTIVATION, FOOD PROCESSING, STORAGE, ETC TO ENSURE FOOD SECURITY.
- THE UTILIZATION OF INDIGENOUS KNOWLEDGE IN THESE COMMUNITIES TO ENSURE SUSTAINABLE FOOD PRODUCTION AND SECURITY.
- ROLE OF GENDER IN FOOD PRODUCTION AND SECURITY.
- PROBLEMS ENCOUNTERED BY INDIGENOUS COMMUNITIES WITH REGARD TO AGRICULTURAL PRODUCTION.
- GOVERNMENT POLICIES TOWARDS THE ROLE OF INDIGENOUS KNOWLEDGE SYSTEMS IN PROMOTING FOOD SECURITY.

INSTRUCTIONS.
Answer all the questions in the questionnaire.
Tick with an (x)
Give views and opinions in the space provided.

Place of interview ----------

Region ----------

SECTION A DEMOGRAPHIC DATA

TICK BY AN: X

1. AGE GROUP
< 30 ( )
31 - 40 ( )
41 - 50 ( )
51 - 60 ( )
61 > ( )

2. SEX
Male ( ) female ( )

3. PLACE OF ORIGIN
Urban ( ) rural ( )

4. MARITAL STATUS
Single ( ), Married ( ), Divorced ( ), Separated ( ), Widowed ( ),
Any other, specify----------

5. EDUCATION
Primary ( )
Secondary ( )
Middle ( )
Tertiary ( )
Any other, specify----------

6. RELIGIOUS AFFILIATION
Christian ( ) Apostolic ( ) Catholic ( ) Protestant ( )
Any other, specify----------

7. OCCUPATION
Teacher ( ) Nurse ( ) Priest ( ) Social Worker ( ) Pensioner ( )
Housewife ( )
Any other, specify----------

8. NUMBER OF FAMILY MEMBERS
< 3 ( ) 3 - 7 ( ) 8 - 12 ( ) 12 > ( )

SECTION B

1. FOOD PRODUCTION METHODS

1.1 What are the main staple foodstuffs in your community?
Mielies ( ), Sorghum ( ), Potatoes ( ), Beans ( ), Peanuts ( ),

Any other, specify ----------

1.2 Do you have a piece of land where you plant your crops? Yes ( ) No ( )
If yes, how big is your land (in hectors)? ----------
1.3 Who owns the land? Yourself ( ), your spouse ( ), your relative ( )
Any other person, specify ----------
1.4 How far is your field from your home (in km)?
< 100 km ( ), 100 – 300 ( ), 300 –500 ( ), > 500 ( )

1.5 Which crops do you plant in your field?
Sorghum ( ), Beans ( ), Any other, specify----------

1.6Which indigenous methods of food production do you know?

1.7 Which of these indigenous methods are still practiced in your community?

1.8 Are these indigenous methods of food production able to provide enough food for the household? Yes ( ) No ( )
If yes, what are their advantages as compared to modern methods of food production?

If no, what are their limitations/ weaknesses? ----------

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2. THE UTILIZATION OF INDIGENOUS KNOWLEDGE

2.1 What are the traditional methods used in your community to control pests and weeds in the fields?

2.2 How do these traditional methods of pests and weeds control operate? ----------
---

What are their advantages compared to modern methods? ----------
---

What are their disadvantages? ----------

2.3 Which traditional methods do you use to maintain soil fertility?

What are their advantages as compared to modern methods? ----------
---

What are their disadvantages? ----------

2.4 What methods do you use to harvest your crops?
Do you call 'letsema'? Yes ( ) No ( )
If yes, how does 'letsema' work? ----------

If no, who helps you during harvesting? ----------
Members of the family ( ) hired people ( )
If you hire people to help you, how do you pay them? ----------
---
What are the limitations of the methods you use for harvesting? ----------
---

What are their advantages? ----------

2.5. How do you store food after harvesting?
In the bags ( ) clay pots ( ) or
Any other method, specify----------
Do you have 'sefalana'? Yes ( ) No ( )
If yes, how big is it? (In terms of the bags or buckets it takes) ----------

2.6.Which indigenous methods and measures do you use to prevent pests from destroying stored food? Ash ( ), Cow dung ( ), Any other, specify ----------
---
Can you explain briefly how these methods work? ----------

Are there restrictions concerning these methods? Yes ( ) No ( )
If yes, what are they? ----------

2.7.What are traditional ways of processing food in your community? (Indigenous food processing techniques) ----------
---

What are their advantages? ----------

What are their limitations/ weaknesses? ----------

2.8. Which food related rituals and taboos are practiced in your community?

What are advantages of these rituals according to tradition? ----------
---

Do you consider these food rituals as important? Yes ( ) No ( )
If yes, why? ----------

If no, why? ----------

2.9How can natural resources such as wildlife, e.g. vegetation and animals' help to ensure food security?

---

3. THE ROLE OF GENDER IN FOOD PRODUCTION & SECURITY

3.1. What food production activities are done by women only? ----------

---

3.2 What activities are done by men anly? ----------

3.3. What activities do both men and women perform? ----------
---
---

4. PROBLEMS ENCOUNTERED

4.1. Do you encounter any problems in planting your own seeds? Yes ( ) No ( )
If yes, can you list the problems encountered ----------

?
If No, where do you store your seeds and for how long do they last? ----------
---
4.3. What role does your livestock play in your household food security? ----------
---

4.4. Does the size of your family affect your household food production and security?
Yes ( ) No ( )
If yes, can you please explain how ----------
---------?

5.GOVERNMENT ASSISTANCE AND POLICY

5.1 What is your perception about the government's attitudes towards indigenous food security strategies? ----------
---

5.2 What type of assistance do you receive from the government, if any, to ensure food security in your community? ----------
---

5.3. Do you know any of the existing food security approaches and techniques of the North West Provincial government? Yes ( ) No ( )
If yes, name them ----------

5.4 In your opinion, what are the limitations or weaknesses of the existing food security approaches and technologies in term of improving household food security and the standards of living in rural areas, alleviating rural poverty? ----------
---
What are their advantages? ----------

THANKS FOR YOUR COOPERATION

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