

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Sudan University of Science and Technology

College of Graduate Studies

Economics of Agricultural Production in North kordofan

State - A Case Study of Shikan Locality

إقتصاديات الإنتاج الزراعى فى ولاية شمال كردفان – دراسة حالة محلية شيكان

A Thesis Submitted for the Partial Fulfillment of the Requirements of the
Degree of M.Sc in Agricultural Economic

By :

Etezaz Mohamed khair Adam Mohamed khair

Supervisor:

Dr: Mohamed Ahmed Osman Ibnouf

2013

الآية

قال تعالى:

وَأَيُّ لُحْمٍ أَرْضَالِيَّةٍ أَحْيَيْنَاهَا وَأَخْرَجْنَا مِنْهَا حَبًّا فَمِنْهُمُ أَكْلُونَ
وَجَعَلْنَا فِيهَا جَنَّاتٍ مِنْ نَخِيلٍ وَأَعْنَابٍ وَفَجَّرْنَا فِيهَا الْفُجُيُونَ

صدق الله العظيم

سورة يس الآية (٣٢-٣٤)

Dedication

This work dedicated to:

My father,,,,,

My mother,,,,

My brothers and sisters,,,,

My colleagues and friends,,,,

With love

Etezaz Mohamed khair

Acknowledgment

First of all my thanks and pries is due to Almighty Allah, the most beneficent, the merciful, for giving me health and strength to accomplish this work.

I am almost grateful to my supervisor Dr Mohamed Ahmed O. Ibnouf, for his assistance, continuous giddiness, encouragement, and meticulous attention and patience throughout the study.

Thanks to agricultural administrator staff for their help. Thanks to my friend Said and Wagdan for their help and also thanks exploded to everybody that helped me with especial thank to my colleges Mohamed Hassan and Suad El Hag.

Table of Contents

Title	Page No.
الآية.....	I
Dedication.....	II
Acknowledgment.....	III
Table of Contents.....	IV
List of Table.....	VII
List of Figure.....	VIII
List of Plate.....	IX
المستخلص.....	XII
CHAPTER ONE.....	1
INTRODUCTION.....	1
1.1 Preface:.....	1
1.1.1 Irrigated farming system subsector:.....	1
1.1.2 Traditional rain fed farming subsector:.....	2
1.1.3 Mechanized rain fed subsector:.....	2
1.1.4 Livestock production system subsector:.....	2
1.1.5 Forests system subsector:.....	3
1.2 Problem statement:.....	3
1.3 Objectives:.....	4
1.4 Hypothesis:.....	5
1.5 Research methodology:.....	5
1.5.1. Data Collection:.....	5
1.5.2 Primary data:.....	5
1.5.2. Secondary data:.....	7
1.5.3. Data Analysis methods:.....	7
1.5.3.1. Descriptive statistics:.....	7
1.5.3.2 Gross margin analysis:.....	7
1.6 Organization of the study:.....	7
CHAPTER TWO.....	8
LITERATURE REVIEW.....	8
2.1 Concepts of Farming Systems:.....	8

2.2 Definition of Farming system:	8
2.3 Factors Determining Farming Systems:	9
2.4 Classification of farming system:	10
2.4.1 Classification according to collecting plant products:	10
2.4.2 Classification according to cultivation system:	11
2.4.3 Classification according to the intensity of rotation between cropping and fallow period:	11
2.4.4 Classification according to water supply:	12
2.4.5 Classification according to the implement used for cultivation:	12
2.4.6 Classification according to the degree of commercialization:	12
2.5. Labor Role in Sudanese Agriculture:	12
Table 2.1. Total and labor Agricultural force 2010-2012	13
Year	13
2.6.1 Role of woman in agriculture:	13
2.6.2 Division of Labor by Gender:	14
CHAPTER THREE	15
The Farming System in North Kordofan State	15
3.1 Introduction:	15
3.2 Area of the study:	15
3.2.1 Location:	15
3.2.2 Population:	17
3.2.3 Climate in NKS:	17
3.2.4 Soils:	18
3.2.5 Economic activities in NKS:	18
3.2.6 Crop production in NKS:	19
3.3. Farming Systems in Kordofan:	25
3.3.1 Nomadic system:	26
3.3.2 Transhumant System:	26
3.3.3 Sedentary System:	26
3.4. Farming Systems in Shikan locality:	26
CHAPTER FOUR	28
Result and Discussion	28
4.1 Socioeconomic characteristics surveyed households in the study area:	28
4.1.1 Gender of household heads:	28

4.1.2 Age of household heads:.....	28
4.1.3 Education level of household heads.....	29
4.1.4 Family size.....	30
4.1.5 Main occupations of household heads:.....	31
4.1.6 Farm income:.....	31
4.2 Land ownership and use:.....	32
4.2.1 Land ownership:.....	32
4.2.2 Land registered in shikan locality, NKS:.....	33
4.2.3 Type of soils:.....	34
4.2.4 Gupraka land:.....	35
4.3 Agricultural activities:.....	35
4.3.1 Crops sowing:.....	35
4.3.2 Shifting cultivation:.....	35
4.3.3 Agricultural rotation:.....	35
5.3.4 Cultivated crop in season 2013:.....	36
4.4 Livestock production:.....	38
4.5. Input used:.....	38
4.5.1 Sources of seeds:.....	38
4.5.2 Fertilizers sources:.....	39
4.5.3 Implements used:.....	39
4.6 Agricultural finance in Shikan locality:.....	42
4.7 Marketing in Shikan locality:.....	42
4.8 Agricultural labor in Shikan locality:.....	43
CHAPTER FIVE.....	51
SUMMARY AND RECOMMENDATIONS.....	51
5.1 Summary.....	51
5.2 Recommendations.....	53
References.....	54
Appendices.....	56

List of Table

Title	Page No.
Table 4. 1: Household surveyed season 2013/14.Average area, and production	37
Table 4. 2: Average number of livestock own by surveyed households	38
Table 4. 3: Marketing place	43
Table 4. 4: Average cost of production per mukames for selected crops production in shikan locality 2013/ 2014 (value in SDG/mu)	45
Table 4. 5: Average cost of harvesting per mukames for crops production in shikhan locality for the 2013season in Sudanese pound (SDG/mu)	46
Table 4. 6: Average Returns per mukhamas for Selected crops for Surveyed Household heads, Shikhan Locality.....	47
Table 4. 7: Millet Gross margin per mukhamas	47
Table 4. 8: Sorghum Gross margin per mukhamas	48
Table 4. 9: Groundnut Gross margin per mukhamas.....	49
Table 4. 10: Sesame Gross margin per mukhamas.....	50

List of Figure

Title	Page No.
Figure 4. 1: Gender of household heads.....	28
Figure 4. 2: Age groups of household heads surveyed.	29
Figure 4. 3: Education level of household heads.....	30
Figure 4. 4:Distribution of families according to the Family size	31
Figure 4. 5: Farm income:	32
Figure 4. 6: Land ownership.....	33
Figure 4. 7: land registered in shikan locality, NKS	34
Figure 4. 8: Type of soil	34
Figure 4. 9: Sources of seeds of household head surveyed in Shikan locality, NKS	39
Figure 4. 10: Implements used in shekhan locality, NKS	40
Figure 4. 11: Types of labor household heads in used farming by the surveyed Shikan locality.....	44

List of Plate

Title	Page No.
Plate 1: Traditional Crop Weeding	40
Plate 2: Animal traction.....	41
Plate 3: Chesil plogh	41

Economics of Agricultural Production in North of kordofan State: A Case Study of Shikan Locality

Etezaz Mohamed khair Adam Mohamed khair (MSC)

Abstract

Agricultural is the main activity in North Kordofan State (NKS). Animal production, traditional farming and raising livestock are the major problem facing the farming. The main objective is assess and calculate the economics of agricultural production in Shikan locality. To meet to objective this study the author used both quantitative and qualitative data. Afield survey was conducted in April 2013 using questionnaire. Group discussion, interviews and observations was also used in data collection 48 household were chosen using simplified random sampling techniques. Was used . Descriptive statistics and gross margin. Analysis results of study revealed that 64 % of studied household heads were male, while 36 % were female. Age of household heads ranged between 23 -75 years with average of 53 years old. About 27 % of household heads were illiterate, 13% received Khalwa education and 70% household heads received formal education. Family size ranged from 6-10 persons with an average of 7 persons per household. The study showed that about 88% of the household heads considered farming as their main a activity, considered it as secondary activity 12 % . The people in the area raise sheep , goats ,cattle . About 13 % of studied household heads practiced animal raising for cash as a secondary activity , while 87 % said animal raising was only for home consumption.

The study revealed that unavailability of production inputs (improved seeds, fertilizers and labors) leads to high production costs. Marginal revenues analysis showed that high production cost was high for sesame then groundnuts, sorghum and millet respectively. Sesame also had a high profitability then groundnuts, millet and sorghum.

The study recommended using animal traction in Gardod lands to facilitate cultivation and harvesting, availability of production inputs and finance and solving marketing problems.

اقتصاديات الإنتاج الزراعي في محلية شيكان – ولاية شمال كردفان

المستخلص

تعتبر الزراعة النشاط الرئيسي لغالبية السكان في محلية شيكان إلى جانب تربية الحيوان تعتبر الزراعة والرعي التقليديين من الشاغلين التي تواجه المنطقة. الهدف الرئيسي للدراسة إقتصاديات الإنتاج الزراعي. أما الاهداف الاخرى شملت وصف للنظام المزرعية في منطقة الدراسة، وصف للعمالة الزراعية في القطاع التقليدي المطرى وتحليل تكاليف الإنتاج في منطقة الدراسة. استخدمت الدراسة كل من البيانات الكمية والنوعية. أجرى المسح الميدان في أبريل ٢٠١٣ باستخدام الاستبيان، بالإضافة إلى المناقشات الجماعية والملاحظات. تم إختيار ثمانية واربعون أسرة عن طريق العينة العشوائية البسيطة. تم استخدام الاحصاء الوصفي والتحليل هامش الربح. أظهرت نتائج الدراسة ان ٦٤% من أرباب لأسر من الذكور في حين ٣٦% من الإناث. تراوحت أعمار أرباب الأسر بين ٢٣-٧٥ عاما بمتوسط بلغ ٥٣ سنة. كشفت نتائج الدراسة أن حوالي ٢٧% من أرباب الاسر من الامين، ١٣% خلوة، بينما ٦٠% منهم تلقوا تعليماً نظامياً. يتراوح حجم الأسرة من ٦-١٠ شخص بمتوسط بلغ ٧ شخص. أظهرت الدراسة أن النشاط الرئيسي هو الزراعة حيث إعتبر حوالي ٨٨% من أرباب الأسر الزراعة كنشاط رئيسي بالنسبة لهم، في حين إعتبر ١٢% منهم بأنها تمثل نشاط ثانوى. تعتبر الثروة الحيوانية النشاط الرئيسي الثانى فى المنطقة. يربى السكان ف المنطقة أعداد صغير من الأغنام والماعز من البقر. يمارس حوالي ١٣% من أرباب الاسر تربية الحيوان كنشاط ثانوى، بينما أوضح ٨٨% من أرباب الأسر بأنهم يمارسون تربية الحيوان للإستهلاك المنزلى. أظهرت الدراسة إلى ان عدم توفر المدخلات الزراعية هو السبب الرئيسي فى منطقة الدراسة عدم توفير التقاوى المحسنة والسماذ ومشاكل العمالة ارتفاع تكاليف الإنتاج الزراعى. أظهر تحليل الهوامش الربحية المحاصيل الدخن والذرة السمسم الفول اعلى تكلفة السمسم، الفول، الذرة والدخن على التوالي. أوجدت نتائج تحليل الهوامش الربحية ان محصول السمسم اعلى ربحية يليه الفول ثم الدخن والذرة. كما اوصت الدراسة بضرورة إدخال المحاريث المسحوبة بالحيوان فى أراضى القردود لتسهيل عمليتى. الزراعة والحصاد أوصت الدراسة توفير المدخلات الزراعية، توفير التمويل الزراعى ودراسة مشاكل التسويق.

CHAPTER ONE

INTRODUCTION

1.1 Preface:

Sudan is an agricultural country gifted with natural resources such as arable land, animal resources, fresh water sources and a variation in climate that qualify the country to contribute considerably to neighboring countries food security (Siding et al, 2011). Agricultural sector plays a central role in the economy of the Sudan and it is seen as the prime engine of the economy machine. Agriculture is the main determinate of Sudan overall economic growth and development. It contributes over 30% of the gross domestic product (GDP), (CBS, 2012). Agricultural provides livelihood for more than 70% of the population. In addition, It provides employment for between 70 and 80 percent of the labor force in rural areas, thus reflecting the predominantly non-subsistence nature of most of the country's farming systems.(MOAI,2013).The Agricultural sector in the Sudan can be look upon from its main as a function of agricultural conditions, acquired technology market and socioeconomic conditions. Five farming systems sub sectors were identified namely: irrigated subsector, traditional rain fed subsector, mechanized rain fed subsector, forestry subsector and animal production subsector (Ali, 2007).

1.1.1 Irrigated farming system subsector:

The subsector covers about 1.7 million hectares, irrigated mainly farm the Nile and its tributaries and includes flush irrigated areas (Tokar, Qash delta), and to ales extent, farm groundwater .The irrigated subsector is dominated by the large irrigation schemes (Gezira, New Half, Rahed and Suki) Which used to be owned and managed by the public sector. The main

crops grown under irrigated include cotton, sugarcane, sorghum, wheat legumes, fruits, vegetables and irrigated fodder (MOAI, 2013).

1.1.2 Traditional rain fed farming subsector:

The subsector largely confined to the 350-800 mm isohyets'. The main crops grown are sorghum, cotton, and sesame. Millets and groundnut are grown in the sandy soils, receiving around 300mm. The subsector is also a major product of gum Arabic and livestock. The cropped area varies about 5.8 million hectares and varies annually with variation in rain fall .crop production is labor. Intensive with hand tools and the productivity is low. The subsector contributes 90% of the millet, 48% of groundnuts', 28% of the sesame, 11% of the sorghum, and 100% of the gum Arabic. Despite its importance the subsector has been largely neglected (Hassan, 2012).

1.1.3 Mechanized rain fed subsector:

The mechanized crop production is traditionally practiced in the heavy clay soils in areas with rain fall between 400-800 mm per annum. The area cropped varies with variation in rain fall. The annual area covered is on the average about 8 million hectares. The main crops in this subsector are mainly sorghum, with sesame and millet, sunflower is also grown in this average. Mechanized rain fed farming accounts for about 18% of the crops contribution to the GDP.

1.1.4 Livestock production system subsector:

udan has over 120 millions of livestock mainly cattle's, sheep, goats, and camels. Livestock production generally confined to the traditional rain fed subsector, and contributes significantly to the GDP and food security of the country. It account for about 45%of agricultural GDP. With a valuable contribution to export earnings in recent years .However, the quantities and qualities of the animal products are net commensurate with its size and falls

short of the domestic and export .Market demand for these products. The livestock is raised under a national pastoral system, which makes them vulnerable to ecological and environmental changes.

1.1.5 Forests system subsector:

Trees provide timber and a good share of energy requirements of country. Gum Arabic produced from” hashab” tree is a valuable export product and provides for shelter belts.

1.2 Problem statement:

Sudan is a one of the leased developing countries. Sudan GDP growth has been increasing at the start of oil exports began in 1999. Until 2008 the growth of GDP averaged 8%, though with the global recession, the demand for oil dropped, but rose again in 2010. Sudan lost 75% of its oil revenues after the southern part of the country became an independent nation in July 2011, (Siddig, 2011).

Overall Sudan’s economic development since independence has been disappointing. It has failed to develop its agricultural potential .During the Oil years (1999-2011) the economy witnessed a boom though with little benefit to the agricultural sector. Despite the deterioration in the share of the agricultural sector in the total exports from 73% in 1998 to 5% in 2008, due to the increase in oil exports, agriculture remains an important sector in the Sudanese economy. It contributed on the average annually 45 % to total GDP during the last ten years. Moreover, agriculture contributes to other activities such as transportation, agro-industries, and commerce, in the industrial, trade, and service sectors which account for a large share of the GDP, (Siddig et al, 2011).

Crop yields in most of the rain fed and irrigated farming systems in the country are still low, well below potential yields. North Kordofan State (NKS) is generally rural. The Main employment opportunities are in livestock

production and traditional farming. Rainfall and its distribution are key determinants of practicing agriculture production. During the last three decades North Kordofan has experienced catastrophic and frequent drought periods with far-reaching consequences on agricultural and pastoral system, regional economy, traditional family livelihood and environment, (Khiry, 2007). NKS occupies an area of about 242,000 square Km, where semi-arid zone encompasses substantial area. The majority of population in NKS is rural farmers, where the livelihood forms include traditional crop farming, village-based livestock raising and employment-generated income from labor production of food crops. About 80% of the labor force in NKS depends on agricultural activities, mostly mixed farming, crop production and animal raising. Traditional farming system represents the major farming system. The main cash crops produced in the area are sesame and groundnut. NKS is jeopardized by environmental, socio-economical and production problems, such as traditional agricultural practices, resource degradation, lack of services and fluctuation in agricultural output. They collectively deteriorate standard of living among the population, (Mohamed, 2006).

1.3 Objectives:

This study is intended to study the farming system in NKS case study of Shikhan locality. The investigation will explore the variable that governs the production system, production cost, and labor use.

The general objective of this study is to describe the agricultural production and labor utilization in Shikhan locality, North Kordofan State.

The specific objectives of the study are to:

- 1- Describe the farming system in the study area.
- 2- Describe labor utilization in traditional rain fed agriculture sector.
- 3- Cost of crop production in the study area.

- 4- Suggest some recommendations for the development of traditional farming system in North Kordofan State and to suggest areas for future research.

1.4 Hypothesis:

Studying the farm system and labor use the researches expect the following hypothesis.

1. The system of production in study area is traditional.
2. Cost of production is low because of poor Technology.
3. Family labor constitutes most of the farm labor in the study area.
4. There are unemployment periods for labor in the study area.

1.5 Research methodology:

In order to achieve the objectives of the study, both primary and secondary data were collected. The collected data is then audited using descriptive statistical analysis and regression analysis. The computer package of statistical pack age of social scientist (SPSS) is used for the analysis. Below is a brief description of data collection and analysis.

1.5.1. Data Collection:

The study was conducted in Shikan locality, North Kordofan State. Both primary and secondary data were collected for the study. Primary data was the main data sources of the study .A field survey was conducted during April, 2013 using a questionnaire to collect primary data.

1. 5.2 Primary data:

Quantitative and qualitative data were collected. Quantitative data was collected through household survey using a questionnaire. The sample was collected from the three administrative units in the locality. The household sample size for the questionnaires was 48 households' heads. The three

administrative units are Abu Haraz, um Ishera, and Rivee Shikan. The area of the study lacks paved roads and regular transportation routes between villages. Private sector cars between the villages in locality provide transportation. Where weekly markets are held the traffic is directed to the location of the market. The researcher, due unavailability of funds and shortage of time select one village from each administrative unit. The selection of the village was based on its easy accessibility from Al Obied. Al Edadat village was chosen to represent Um Aishara administrative unit, BonGadeed village was selected to represent Rivee Shikan administrative unit, and Abgoad village was selected from Abu Haraz administrative unit. In each village a call was done to the village Shiken. The village Sheik represents the official and traditional leader of the village. Usually the village Sheik is the most informed person about the residents of the village. The researcher in each of the three villages selected informed the sheik well about the research objectives and the researcher affiliation to get the trust of the sheik. The village sheik asked household's heads present in the village to gather in his house. From the group of the households heads that came to the sheik house 16 households heads were selected. Selection of households was done randomly by writing the names of all villagers that were present in the sheik house. The researcher personally filled the questionnaire with each of the selected household's heads. The questionnaire includes socioeconomic characteristics of the household head and his family, land owned or rented, agricultural activities, production inputs used, agricultural knowledge gained, livestock owned knowledge about, production cost, farm in labor used, and marketing of farm products. Group discussions were held to gain, number of families in the village, desertification impact in last year's, labor problems, obstacles and constraints facing agriculture and its causes, financing facilities, sheil system of finance, labor migration to gold mining areas, sources of water and if other constraints facing the agricultural production.

1.5.2. Secondary data:

Secondary data was collected from published and unpublished reports of government agencies, NGOs, UN agencies, besides theses, books, etc.

1.5.3. Data Analysis methods:

1.5.3.1. Descriptive statistics:

Descriptive statistics was used to deal with the first objective of the study. Description of the study area, household demographic characteristics, socioeconomic factors, cropping pattern, livestock, farm labor, off-farm activities and their effects on the population services received, problems facing rural population in study area using frequency, percentages, means and medians.

1.5.3.2 Gross margin analysis:

The type of budget provided in the Farm budgets and costs section is the gross margin budget. A 'gross margin' is the gross income from an enterprise less the variable costs incurred in achieving it. It does not include fixed or overhead costs such as depreciation, interest payments, rates, or permanent labor. The gross margin budgets are intended to provide a guide to the relative profitability of similar enterprises and an indication of management operations involved in different enterprises.

1.6 Organization of the study:

The study includes five chapters; the first chapter contains introduction, problem statement, objective, research methodology and organization of the study. Chapter two contains a literature review, while chapter three includes description of the farming system in the study area. Chapter four includes the crops grown in area of the study cost of production. Chapter five presents the summary of the study, conclusion and recommendations out of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Concepts of Farming Systems:

A system is a set of inter-related, interacting and interdependent elements acting together for a common purpose and capable of reacting as a whole to external stimuli. Farms are systems because several activities are closely related to each other by the commons of the farm labour, land and capital, by risk distribution and by the joint use of the farmer's management capacity. The analysis of farms is quite important to the subject of development relevance of the farming systems approach. Choosing policies for agricultural development requires the use of information about the existing farming situation. A farming system results from a complex interaction of interdependent and interrelated components of elements that bear upon the agricultural enterprises of the rural household. At the center is the farmer who takes decision in an attempt to achieve his aspirations, goals and desired objectives within the limits of technologies available to him. He uses inputs to get outputs in response to the technical elements which is the natural resource endowment in any given location restricting what the farming system can be. The human element provides the framework for development and utilization of a particular farming system .(Elemo, 2012)

2.2 Definition of Farming system:

Farming system is a broadly communities of plants or livestock, which are managed to obtain food, profit, satisfaction or, most commonly a combination of these goals. A number of terms and concepts have been used to describe the farming system as; Fresco *et al*, (1994) defined farming system as a decision making unit, comprising the farm household, cropping and livestock system that produces crop and livestock products for

consumption and /or sale FAO (2001) and Doppler (2002) stated that. Farming systems are; population of farms that have broadly similar resource base, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate. Also Beets (1990) have defined a farming system as a unit consisting of a human group (usually a household) and the resources it manages in its environment, involving the direct production of plants and /or animal products. Factors such as climate and weather, land tenure, land quality and socioeconomic factors are included. It is an ecosystem in which all of the components, land, operator, hired labor, crop and cropping system, animals and machinery, are considered together to produce goods to meet the requirement for foods, clothing, and Shelter, to exchange for goods meet part or all those needs. A farming system always part of a larger social, political, economic, cultural environment that impact on everything happening within the farming system. Thus it can be said that the next level of analysis upward can be a rural village, a compound, or some physical unit of space including several farming system.(Ali,2007).

2.3 Factors Determining Farming Systems:

Elemo (2012) claimed that the farming systems determinants can be grouped according to physical, biological and socioeconomic factors.

1. Physical factors:-

They include Physical factors can be grouped into:

1.1 climate: The component of which include, solar radiation, rainfall, temperature, relative humidity and wind.

1.2. Soils:- the sub factor that affect soil interaction include clement such as, soil aeration and structure , soil reaction ,soil fertility, Supply of mineral nutrients absence of growth-restricting substances Topography.

2. Biological factors: - biological factors that affect farming systems include elements such as, crops, livestock raised, type of weeds and Pests and diseases in the area.

3. Socio-economic Factors:-

The Socio-economic Factors has an impact on farming systems include endogenous and exogenous factors.

3.1. Endogenous Factors:- endogenous factors include factors that are within the household. These factors are family composition, health and nutrition conditions of the household level of education, member's food preferences of the household their risk attitude/goals of the family members, and their gender relations.

3.2 Exogenous factors:- These are factors that are outside the control of the household. Such factors include the population of area on the country at large, land tenure in the area, off-farm opportunities, social infrastructure, access to credit, markets and marketing opportunities, level of prices for inputs and outputs, level of technology used input supply, extension service available, and savings opportunities (Elemo, 2012).

2.4 Classification of farming system:

Farm as a unit transfers input into agricultural output and which undergoes changes over time. In the process of adapting cropping patterns and farming techniques to the natural, economic and socio-political conditions of each location and the aims of the farmers, distinct farming systems are developed. For the purpose of agricultural development it is advisable to group farms with similar structures into classes. Classification of farming systems depending on their characteristics put them in different types as described below.

2.4.1 Classification according to collecting plant products:

This is the most direct method of obtaining plant products. It includes regular and irregular harvesting of uncultivated plants. Hunting goes hand in

hand with collecting. It is still being practiced to provide additional to the normal subsistence food supply. It is only in few cases like wild gum Arabic in Sudan which is a major cash earning activity.

2.4.2 Classification according to cultivation system:

This class is more important than collecting. Classification according to type of rotation cultivation alternates with an uncultivated fallow which may take the following forms Forest fallow made up of woody vegetation with trunks, a bush fallow comprising of dense wood without trunks. A savanna fallow comprising of a mixture of fire resistant trees and grasses and in which grasses are dominant 4. a grass fallow comprising grass without woody vegetation, Lay systems describes where grass is planted or establishes itself on previously cropped land. The grass is allowed to grow for some years and used for grazing. Wild and unregulated lay are common in the savanna. In regulated lay, the stands are established during the non cropping period. Field systems occur where arable crops follow another and where established fields are clearly separated from each other.

2.4.3 Classification according to the intensity of rotation between cropping and fallow period:

Considerable variation and degree of intensity exists between cropping and fallow period within one cropping cycle. The symbol R is the number of years of cultivation divided by the length of the cycle of the cycle of land utilization multiplied by 100. If 20% of available land in one holding is cultivated, then R is 20%. The larger R becomes, the more stationary is farming. When is < 33%, it is shifting cultivation: When $R > 33\%$ and $< 66\%$ it is Fallow systems: while it is permanent cropping when $R > 66\%$. Permanent cropping can again be classified according to the degree of multiple cropping. An R value of 150 would indicate that 50% of the area is carrying two crops a year and three crops a year for a value of 300.

2.4.4 Classification according to water supply:

This is in terms of whether it is irrigated farming or rain-fed farming Classification according to the cropping pattern and animal activities. This classification is according to the leading crops and livestock activities of the holdings. Each activity has different requirements as to climate, soils, markets and inputs e.g. sesame-sorghum holdings or sugar cane holdings

2.4.5 Classification according to the implement used for cultivation:

In different parts of the world, land is cultivated by methods that require no implement or simple tools. In the Sahara desert nomads sow millet without fire-farming or soil preparation, shifting cultivators frequently sow in ashes without touching the soil. Sorghum growers in central Sudan use tractors to cultivate on clay fields. The main divisions vary from hoe-farming or spade farming to farming with ploughs and animal traction to farming with tractors.

2.4.6 Classification according to the degree of commercialization:

Farms can be classified into three groups based on the destination of the agricultural output ; Subsistence farming if there is virtually no sale of crop and animal products, partly commercialized farming, if more than 50% of the value of the produce is for home consumption, and commercialized farming, if more than 50% of the produce is for sale (Elemo,2012).

2.5. Labor Role in Sudanese Agriculture:

Agriculture is the principal economic activity in the country, contributing 40 of the G.N.P., a source of employment for about 90% of the working population and almost 95% of Sudan exports are from agricultural origin. The Sudan total area accounts for about 625 million feddans of which 200 million feddans is arable land. The area of land at present cultivated is 17 million feddans of which 13 m. f. is supporting rain-fed agriculture and 4 m.f. are under irrigation. Of the 13 m, f.

some ten million feddans is under traditional subsistence farming depending on primitive methods and implements and about three million feddans are at present under mechanized farming. The traditional subsistence agricultural sector has been and continues to be the main source that supply labor-to the irrigated and the mechanized rain-fed sectors. The need for labor in the mechanized rain-fed sector is seasonal, while in the irrigated sector is year round. Apart from, the importance of other factors of production, labor is considered to have the largest impact on the production in the irrigated sector. For this reason the declining trend in the levels of productivity of the rain crops grown in the irrigated sector witnesses' in recent years, is largely attributed to the labor shortage. One of the reasons of labor shortage is the large expansion of cultivated area under irrigation. Moreover the diversification and intensification policies adopted in the large scale irrigated schemes call for more use of labor. Despite the fact that about 90% of the country working population is employed in agriculture, the concentration of these schemes in certain geographic localities has led to labor shortage in them. Also the increasing dependence of tenants in the irrigated agriculture, on hired labor creates competition that lead to labor shortage. This is evident as labor shortage is markedly faced in peak periods of crops establishment and harvesting which are times-specific (El seed, 1977).

Table 2.1.Total and labor Agricultural force 2010-2012

Year	Agricultural Labor	Total Labor
2010	6510.00	14795.00
2011	3026.57	8346.67
2012	3118.00	8589.00

2.6.1 Role of woman in agriculture:

Women represent 49% of the farmers in the irrigated sector and 57% in the rain- fed traditional sector. Women in the rain -fed sector are primarily

subsistence farmers but they also work as seasonal wage laborers' in the rain-fed mechanized sector, and as hired or unpaid family laborers' in the irrigated sector. Although women play a crucial role in agriculture, contributing to both the GDP and to household food security, their contribution to agriculture and the overall economic development process continues to be undervalued (FAO, 2011)

2.6.2 Division of Labor by Gender:

Women carry out a major portion of agricultural activities and bear almost the entire burden of household work, including water and fuel wood collection and food processing and preparation. According to a Ministry of Agriculture baseline survey of the rain-fed traditional sector in 1989, both men and women participate in land clearance and in the preparation, harvesting, transporting and marketing of crops, while women carry out most of the planting, weeding and food processing. In the livestock sector, men have the primary responsibility for cattle and sheep raising, while women participate in milking and processing milk products. Both men and women are involved in raising goats and poultry. In fisheries, women participate in processing and marketing. In the agro-forestry sector, women participate in all aspects of the work and have the major responsibility for seedling preparation and weeding. Men and women are sometimes responsible for different types of trees (FAO, 2011).

CHAPTER THREE

The Farming System in North Kordofan State

3.1 Introduction:

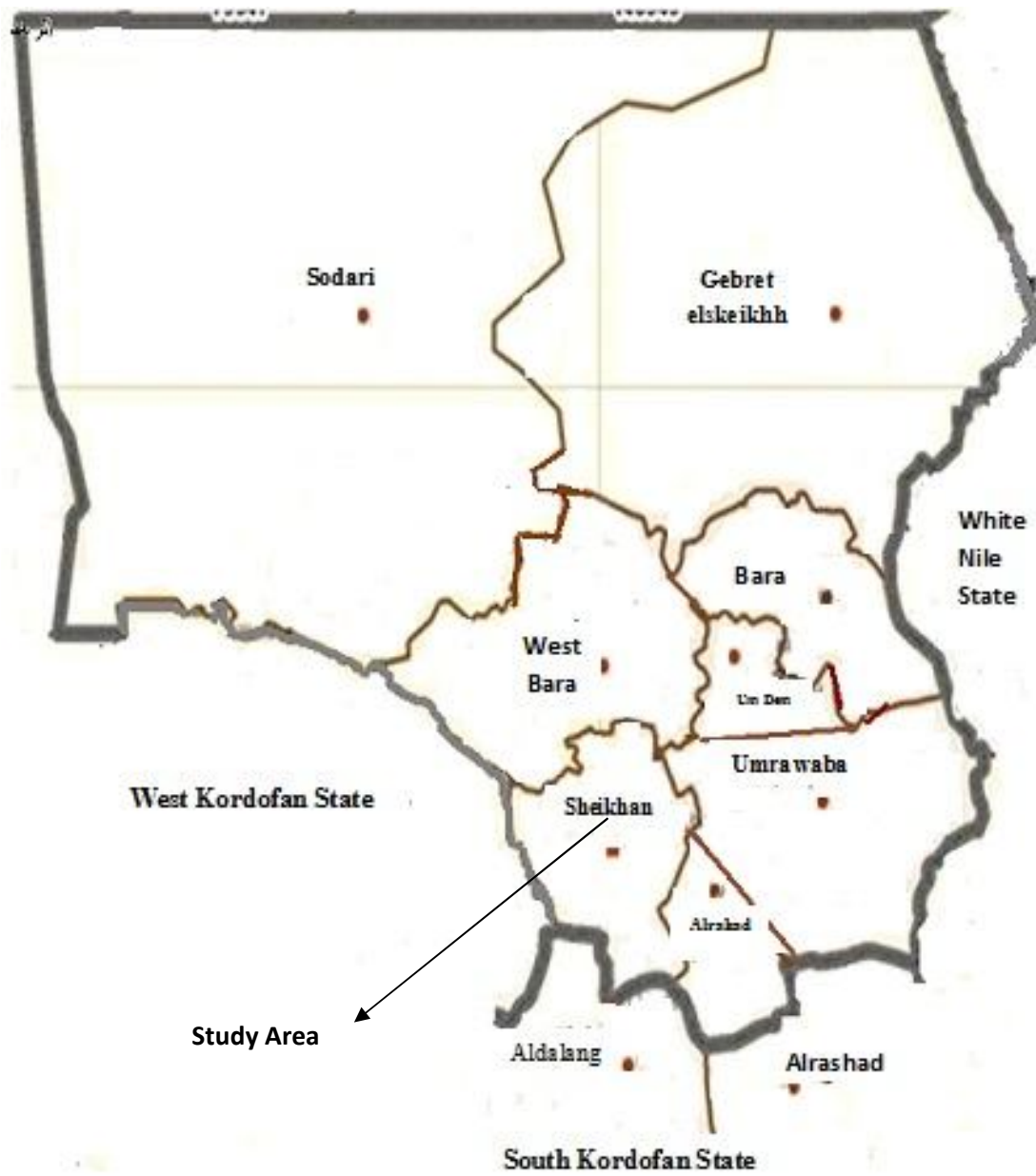
The prevailing farming system in the NKS is traditional agricultural system that depends on seasonal rain water. It is characterized by farmer with small holdings (5- 30) feddans. North Kordofan State had a share in the export of agricultural and livestock products, namely groundnut, sesame and live sheep's. The state had a comparative advantage in production of some crops such as groundnut and sesame and forest productions such as gum Arabic. Other cash crops include water melon seeds and karkadi the state is well known for its livestock production being a home to sheep's, goats, cattle's and camels. The breed of sheep known as Al Hamari is of the most preferred sheep's breed for meat consumption. Al. Obied market represents the major market for Gum Arabic, as NKS is dominated by *Acacia* spp. That produces gum. Agricultural production in the state is traditional characterized with low productivity (Ministry of Agricultural and Animals Resource, 2012).

3.2 Area of the study:

3.2.1 Location:

North Kordofan State is in the central part of the Sudan. The climate of the state is mostly arid and semi arid. The state lies between latitude 12⁰- 16⁰ north and longitude 27⁰- 32⁰ east .The area of state is estimated at 244, 700 square Km. The state is bordered by the Northern state from the north, Khartoum to the Northeast, White Nile State to the east, East Kordofan to the west, and southwest and South Kordofan to the south (Ministry of Agricultural and Animals Resource, 2013). Map 1 below show the administrative localities of NKS.

Plate 1: Map North Kordofan State localities'



3.2.2 Population:

According to latest census in Sudan (2008) NKS ordered third State with respect to population after Khartoum State and Southern Darfur State. The total population of NKS was estimated at 2,920,992 persons represent (SCBS, 2009). Of which 24%urban, 71%rural and 5% nomads. The average family size is 6 persons with annual growth rate of 2.25%. NKS is divided into twelve localities which are: Shikhan, North Bara, West Bara, UmRuwaba, Sodari, Gebret el Skeikh, AlRahad and UM Dam Haj Ahamed. In Sheikan locality the total population is about 372346 persons, of which 62% urban and 38% are rural. 98% of the rural population in shikhan sedentary and 2% are nomads (SCBS, 2009).

3.2.3 Climate in NKS:

North Kordofan State is lies within the dominantly prevailing arid and semi-arid desert climate (poor Savanna climate) with limited seasonal rains. The mean annual rainfall ranges from less than 100mm in the north to about 350mm in the south. Four seasonal periods are recognized by the locals, the rainy season (locally called kharif) from May to October with peak rains in August, harvest season (Dart) from October to December, a mild cold season (Shita) from December to mid-February with moderate temperature and comfortable humidity, and a hot dry season (Seif) from March to mid-May. Rainfall precipitates is short with high intensity storms over six months from May through October, with concentration of 80 to 90% of the rainfall in July, August and September. Rainfall shows a great variability both in time and space. The mean annual temperature is 27⁰ C with extreme temperature ranging between 10⁰ C to 46⁰ C. Mean relative humidity ranges from 20% in winter to 75% during August, in the middle of the rainy season. The prevailing winds in the study area blow from north east during winter and from south west during summer. Winds have medium speed generally with

less than 3 meters/second, but are quite capable of moving sand from sand dunes when soils are exposed (Khiry, 2007).

Table 3.1 shows rain fall in some North Kordofan State rainfall stations in millimeter, 2005 -2012.

Table 3.1: Rain fall in selected NKS stations 2005-2012 in millimeter

locality	2005	2006	2007	2008	2009	2010	2011	2012
Shikan	331.7	556.3	647.2	435.5	497.7	422.9	304	526.1
UmRuwaba	291.5	203.1	352.7	320.1	419.7	335.2	298.7	327.5
AlRahad	184.2	269.6	551.9	406	234.5	339.2	405.4	316.5
UM Dam	230.8	171.7	305.3	204.8	250.6	258.8	75.8	290
Bara	405.5	318	529	177.6	334.4	172	203.3	305
West Bara	213.8	289.1	435.8	131.4	276.6	224.5	311.8	282.7
Gebret	106.8	232.6	310.6	109.7	206	153.1	74	151.1
Sodari	165.6	144.7	228.5	91.3	89.4	131.9	39.3	164.8

(Ministry of Agricultural and Animals Resource, 2011).

3.2.4 Soils:

North Kordofan state soils are dominated by e sand dunes in the Northern parts of the state. While the middle part of the state soils are largely gardod soils. Towards the southern part of the state clay soils are dominant. Around water courses and streams sedimentary soils are found.

3.2.5 Economic activities in NKS:

North Kordofan State is geographically located in the central Sudan. Live hoods activities include traditional farming and nomadic livestock raising as the major activities. Collection of timber and non timber forest products represent part of live hoods opportunities, especially gum Arabic collection. During the past several decades livelihoods activities have been affected by frequent drought cycles. Climatic conditions and land mismanagement (overgrazing, over cropping deforestation) have caused vegetation cover in the state to become very poor. Furthermore, as the state is

bordering the desert zone, there is a persistent threat associated with shifting sand dunes and desertification, which has been exacerbated by recurrent droughts. The poor resource base and low technology utilization contribute to low productivity. Few crops dominate agricultural production, and these are often a mix of staple and cash crops. In addition to the crop diversification of crops, farmers plant their crops before the onset of first rains (remai) as a measure to get maximum moisture from the short and intense rainfall. Farmers derive their income from diverse sources. Principally crop and livestock production, collection of forest products, transfers from family members, and wage income. Household coping strategies to overcome low income opportunities includes migration, shift in income sources toward sale of livestock, use of personal savings, and –remittance from family members. Reduction in frequency and size of meals consumption of forest products are also some of the strategies to cope with low incomes. Pastoral and agricultural pastoral systems are another mainstay of the economy. Livestock and/or its products are the primary source of income for over 60% of the North Kordofan population (Ahmed, 2012).

3.2.6 Crop production in NKS:

Crop production has been and continues to be an important source of income of the agrarian economy in much NKS. Rainfall is mostly the major factor in determining the division of NKS into two agricultural zones. The north part of the state represents relatively low rainfall area and the south represents relatively high rainfall area. The major food crops grown are millet and sorghum. Whereas the major cash crops include groundnut, sesame, gum Arabic and rosella. Other important crops in the area include watermelon with some vegetable crops such as tomatoes and okra around the "kheiran" (water streams) mainly Abu Habil seasonal stream areas. The dominant livestock in NKS are mainly sheep, goats, and camels in the northern part of the state, sheep, goats and cattle in the southern parts of the state. In the northern parts

of the state, land use is characterized by mobile pastoral system practical by different nomadic tribes each has its own territory or” Dar”. In the southern parts of the state land use is characterized by sedentary agricultural pastoral system including Gum Arabic production, (Ahmed,2 012).

Sorghum and millet are strategic crops as staple food crops for the majority of population in the state especially in the naval area. It is consumed in almost all regions of the country by almost all income groups. Sorghum and millet is the most important cereals’ widely used as a livestock feed in the developed countries while in the developing countries it is the nutritional backbone. In the urban areas of the Sudan the importance of sorghum and millet as staple crop deceased leaving for wheat.

This is especially free for millet which occupies a larger area than sorghum (figure)

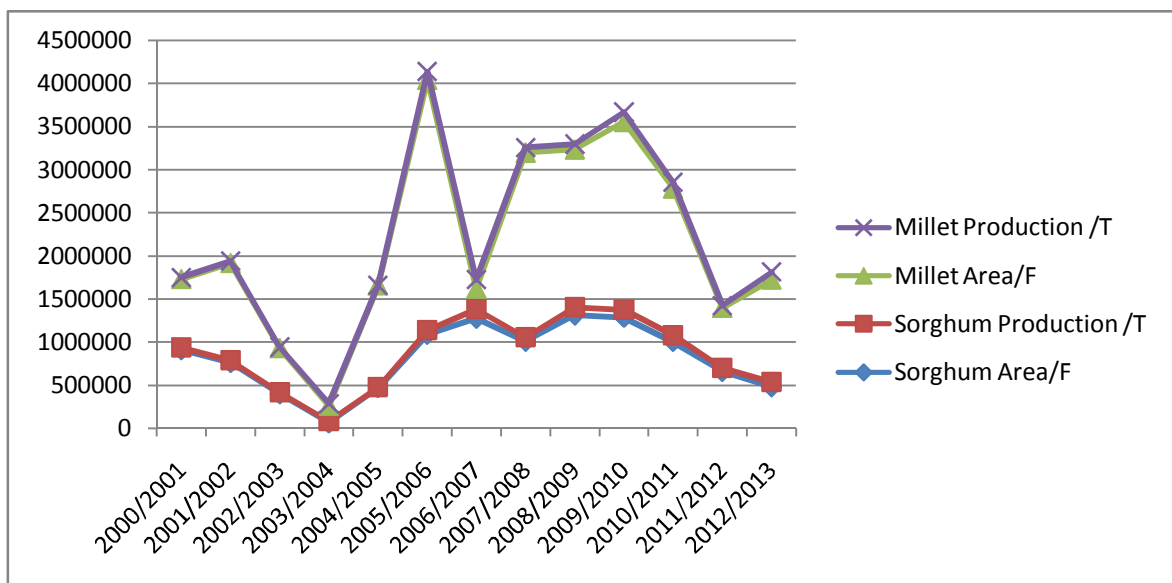


Figure 3. 1: Area (000feddan), production (000ton), of Sorghum and millet

Source: (Ministry of Agricultural and Animals Resource, 2013).

Note: production in metric tons’ = T

Area in feddans = F

The figure shows a clear indication of low productivity of the two crops. This is manifested by the fact that the area and the production are almost comparable (even with difference in measurement unit).

Groundnut is a member of the family leguminosae and is believed to have originated in Brazil. It is one of the most widely spread and important food legumes in the world. It is also an important cash crop in Sudan. Groundnut is used for edible oil and Groundnut used for manufacturing of soap. The seed - cake and hay are valuable for animal feed may be used as manure, animal feed, source of heat and raw material for many products. In the developing countries, groundnut is playing an important role for both oil and food. However in India the consumption of groundnut was about 10 Kg per capita (Sitar, 2010)

Sesame is one of the two oldest cultivated oil crops known to man, (the other crop is coconut), parts of sesame crushing equipment that date back to 2500Bc were found in archeological sites in ancient Iraq and ancient Egypt as early as 1552Bc, and because it is grown since time immemorial, plant historians have disagreed as to its native home. Sesame is grown mainly in two regions in the Sudan, The sand dunes of the western Sudan (Northern, Eastern, and, central parts of greater kordofan). The rain in that area ranges between (350mm-550mm). Sesame is one of the main cash crops grown in the Sudan, and it is a major source of income for rain- fed producers both in traditional and mechanized farming system (Warsame, 2010).

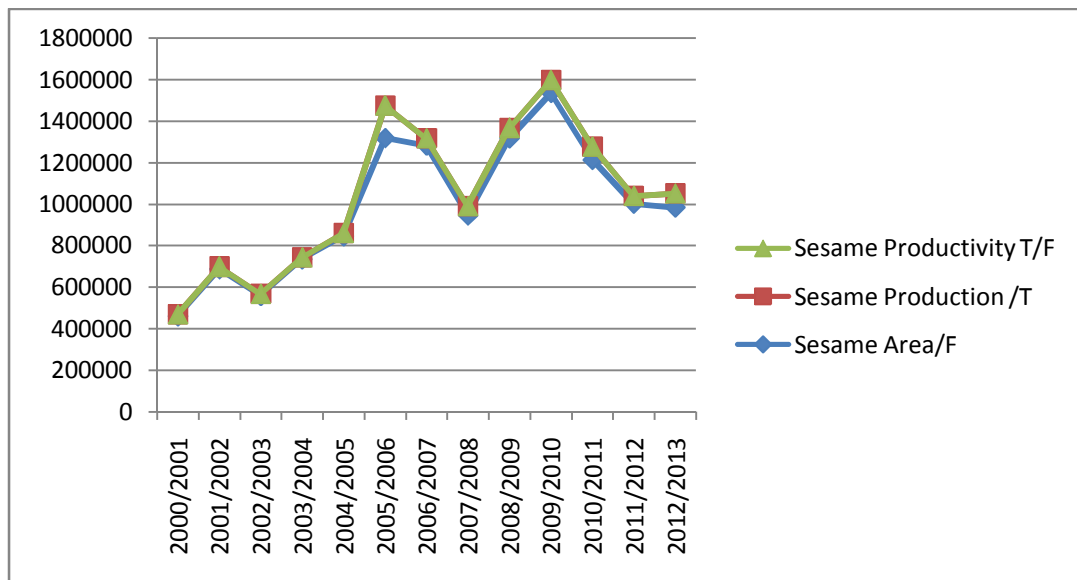


Figure 3. 2: Area (000feddan), production (000ton), and Productivity (T/F) of Sesame

Source: (Ministry of Agricultural and Animals Resource, 2013).

Note: production in metric tons ' = T

Area in feddans = F

Productivity = T/F

Figure (3.2) showed that although largest area of sesame was during season 2009-2010, production and productivity were low due to little rain and lack of production inputs. High production was during season 2005/06 although the area was less than season 2009/2010 due to higher level of rain and it was well distributed.

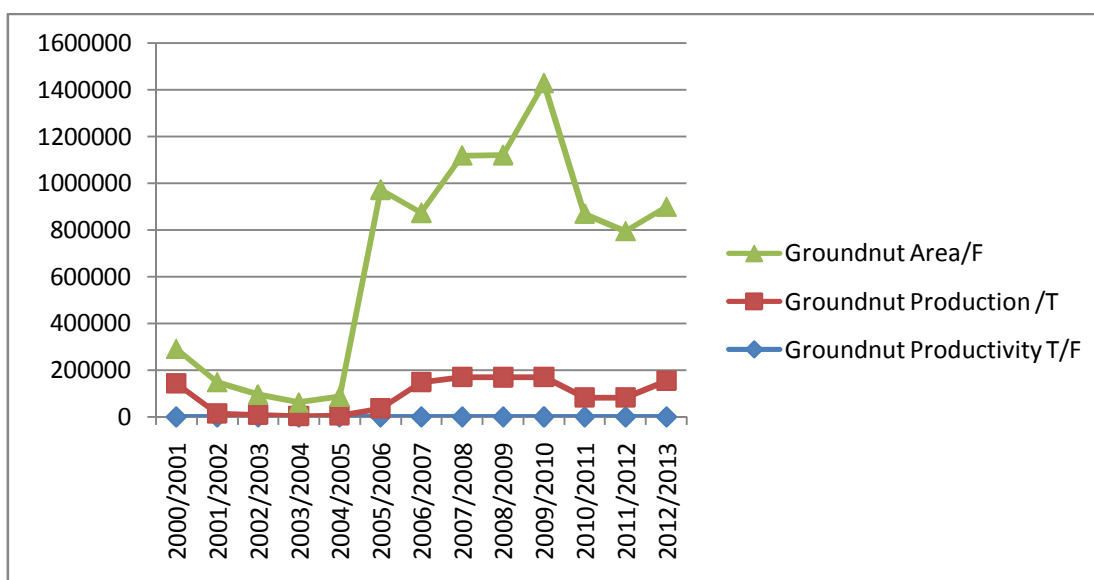


Figure 3. 3: Area (000feddan), production (000ton), and Productivity (T/F) of Groundnut

Source: (Ministry of Agricultural and Animals Resource, 2013).

Note: production in metric tons $\text{'} = T$

Area in feddans = F

Productivity = T/F

Figure (3.3) showed that the highest area of groundnut was during season 2009/2010, during season 2000/2001 and highest production was during season 2007/2008. The lowest productivity was during season 2005/06 while the lowest area and production was during season 2003/04. This was due to the diffusion of pests and diseases, little rain and the absent of production inputs and climatic changes 3.2, 6.3 Melon seeds and Karkadae.

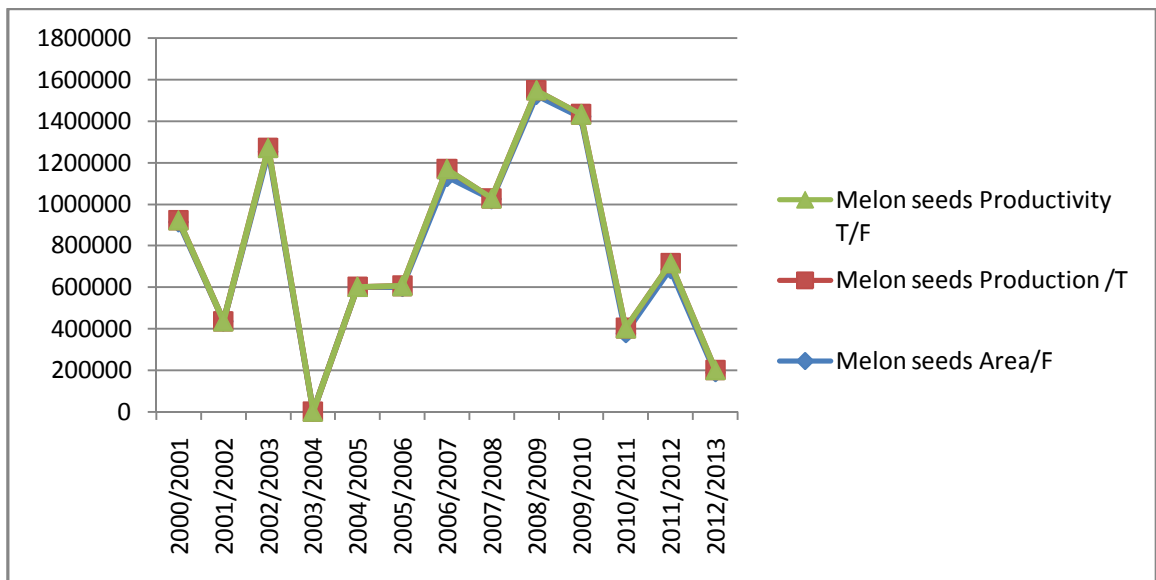


Figure 3. 4: Area (000feddan), production (000ton), and Productivity (T/F) of Melon seeds

Source: (Ministry of Agricultural and Animals Resource, 2013).

Note: production in metric tons = T

Area in feddans = F

Productivity = T/F

Figure (3.4) showed that the highest production was during season 2003/04, the highest production was during season 2006/07 and the highest area was during season 2011/2012 the highest area was during season 2011/2012 the lowest productivity was during season 2004/05 the lowest production and area were during season 2003/04. Although the lowest area was during season 2003/04 comprised with highest productivity in the same season due to well distribution of rain and less infection of pests and diseases.

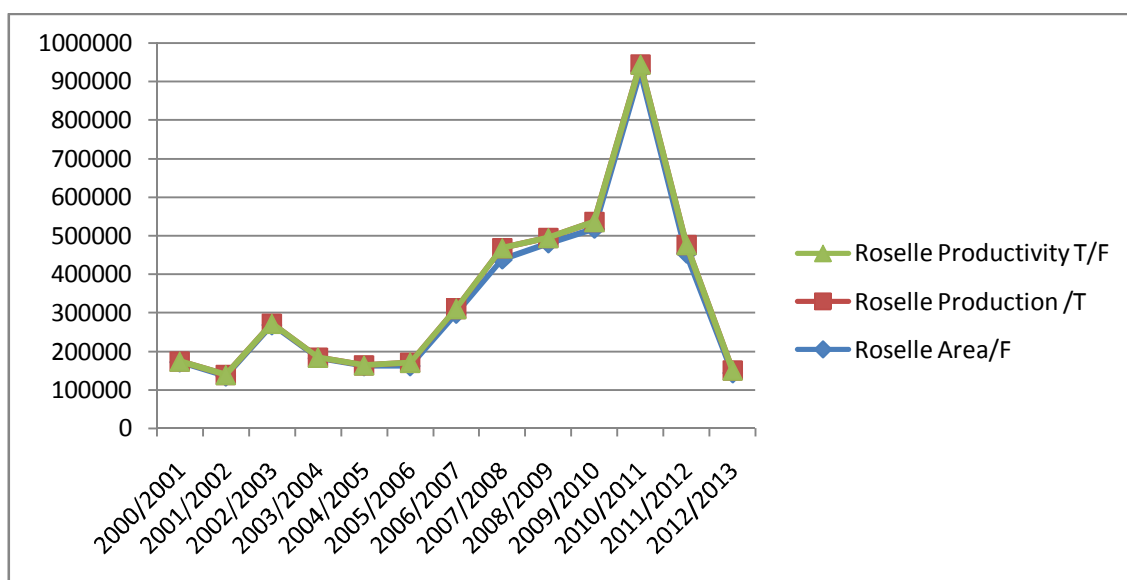


Figure 3. 5: Area (000feddan), production (000ton), and Productivity (T/F) of Karkadae

Source: (Ministry of Agricultural and Animals Resource, 2013).

Note : production in metric tons ' = T

Area in feddans = F

Productivity = T/F

Figure (3.5) showed that the highest area was during season 2010/2011, highest productivity was during 2005/06 and the highest production was during 2007/08. The lowest area was during season 2001/2002 and the lowest production and productivity were during season 2003/04. Low productivity and production during the same season indicate that they were less rain and absence of production input and bad climatic conditions during their season.

3.3. Farming Systems in Kordofan:

The farming systems in Kordofan Region, which include north and south kordofan states, are based on traditional systems of cropping and animal husbandry. The major crops grown are millet, sorghum, (food crops), and groundnut and sesame (cash crops). Other crops grown are watermelon, Karkadae (roselle), cowpea, maize, cotton, and okra. Animals raised are mainly sheep, goats and camels in the north and cattle and goats in the south. Production systems in the region can be classified into: -

3.3.1 Nomadic system: The nomads' livelihood (more than 50% of the gross household revenue) depends on livestock and they migrate in search of water and forage. This system can be divided into two subsystems: -

a- Camel nomadic subsystem: Camel is the main livestock raised in this system. Kababiesh and Kawahla are the main tribes under this subsystem.

b- Desert sheep nomadic subsystem: Sheep is the main livestock species. Shanabla is an example of this subsystem.

3.3.2 Transhumant System: Transhumant's migrate seasonally following traditional grazing routes. Millet, sesame and groundnut are also cultivated along the route. Cropping activities play a relatively minor role in the system. They usually raise cattle, sheep and goats. Examples of transhumant groups are Messeriya and Hawazma tribes.

3.3.3 Sedentary System: Includes both agronomic and livestock components and is dominated by cropping activities based on bush-fallow cultivation system. The major crops are millet, sorghum, sesame and groundnut. Sheep is the dominant animal species. Dominate ethnic groups in this system are Nuba, Bideriya and Gawamaa.

3.4. Farming Systems in Shikan locality:

The farming system in Shikan locality consists of three types. Sedentary farming system that's is engaged in crop production and raising small ruminant which comprises settled villagers who practice mixed farming system as a main occupation and off farm activities as secondary occupation. Nomadic subsector or migratory system which depends on animals raising. Transhumant system agriculture pastoral subsector which based on both animal raising and crop production, (Osman,2009).

Traditional rainfall system production are mainly dominant in western and parts of the central Sudan millet production is concentrated in the traditional sector, and in NKS millet represent the major grains crop

area and production wise. Sorghum comes second to millet in NKS in its area and production. The tow crops represent the source of food security in KNS. Agricultural productivity is generally low in the crop sector and the animal sector in the state. This low productivity with the annually variation in the agricultural production in the state is attributed mostly to the climate and low technology used in production.

CHAPTER FOUR

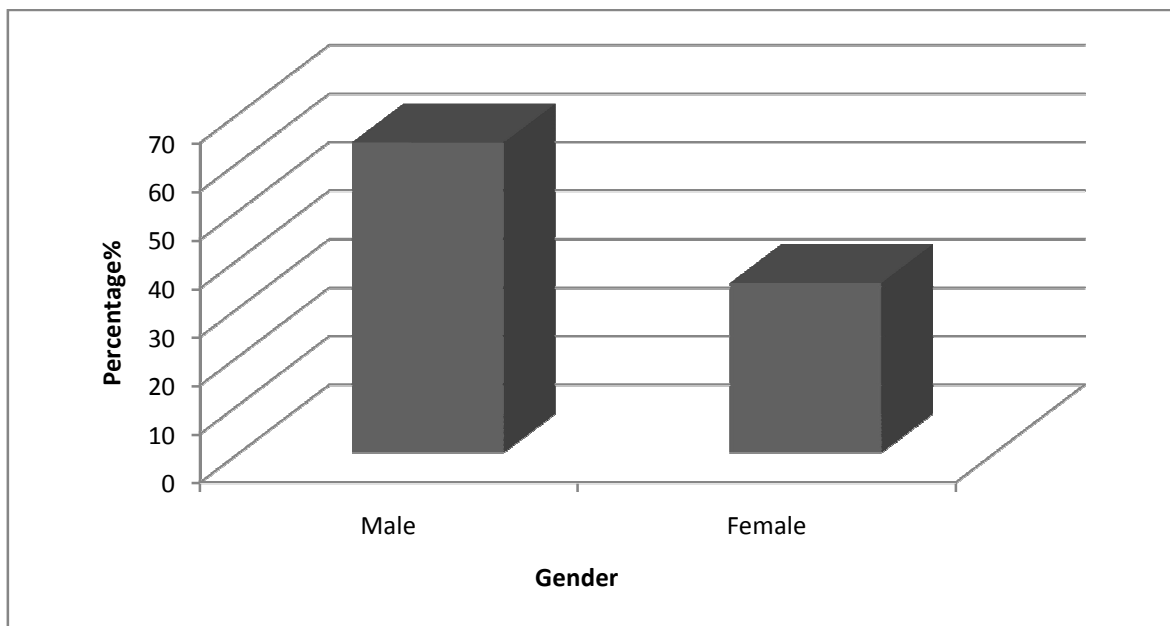
Result and Discussion

4.1 Socioeconomic characteristics surveyed households in the study area:

4.1.1 Gender of household heads:

The results of the study showed that about 64 % of household heads were males while 36% were females. This may be attributed to customs and traditions in the area, which do not allow divorced and widower women to live in separate households especially if they were young or have no grown up children's. See figure 4.1.

Figure 4. 1: Gender of household heads.



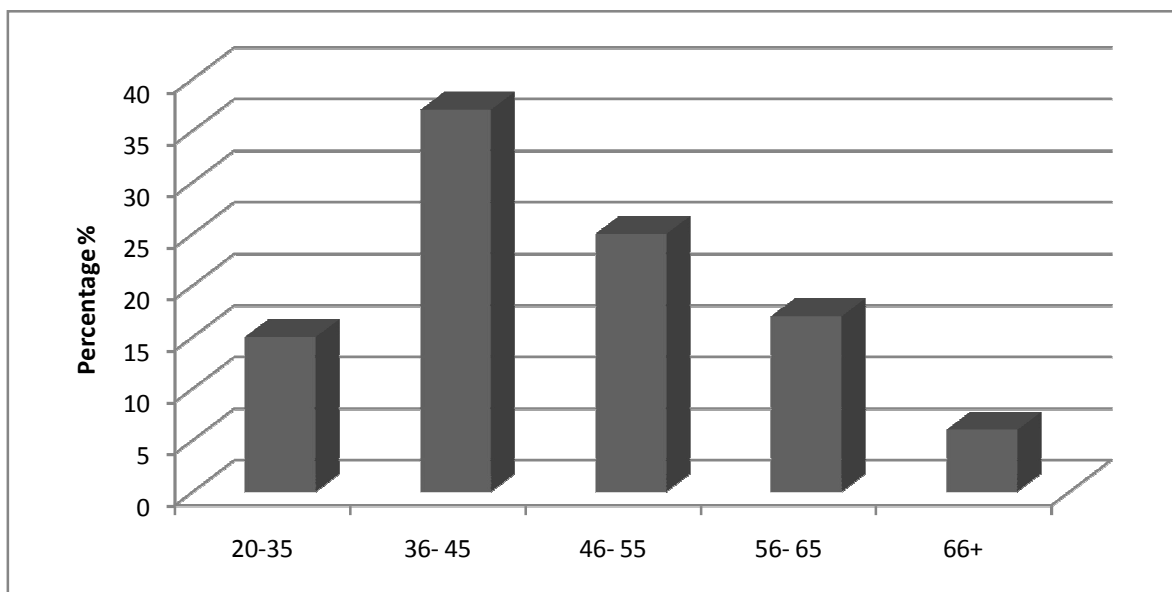
Source: Field survey, (2013)

4.1.2 Age of household heads:

Age of household heads surveyed ranged between 23- 75 years with an average of 50 years old. Age of the household heads grouped in to five group (20-35, 36-45, 46-55, 56-65, 66+ years). The results of the analysis of the age groups revealed that, age group (36-45 years) was the highest one among all

age groups and represented 36 % the household heads, followed by age group (46-55 years) which constituted 25% of household heads. Whereas age group (56- 65years) represented 17% of household heads, (20- 35 years) group represented 15% , and finally age groups (66+ years) represented 7% of household heads.(Figure 4.2). The majority of household heads were young because many of the youth in the area dropped out from school and established new families.

Figure 4. 2: Age groups of household heads surveyed.



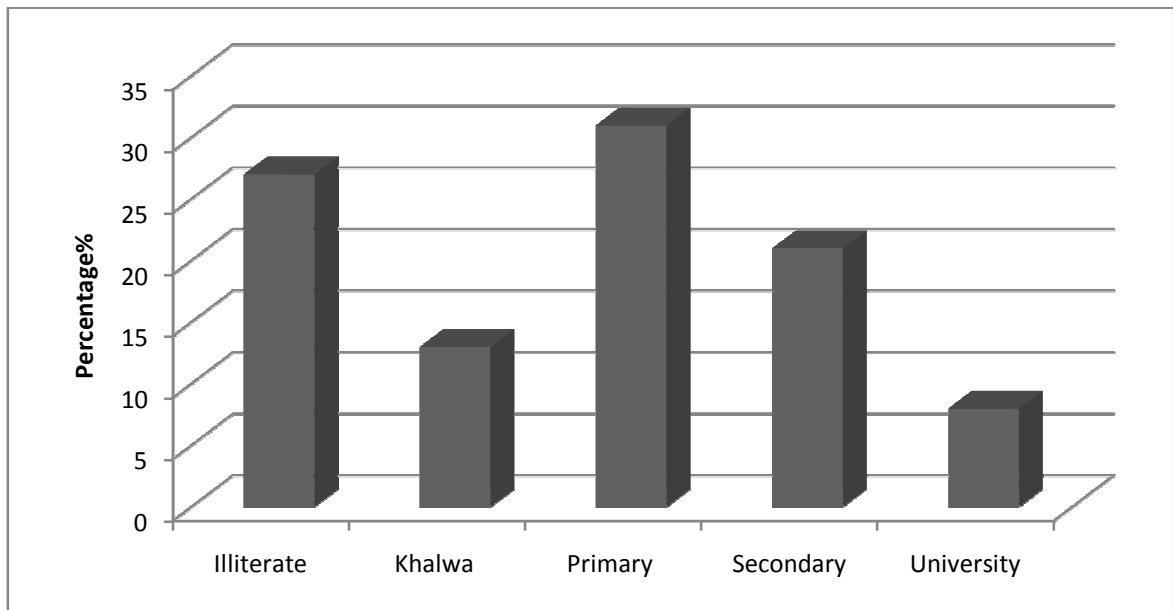
Source: Field survey, (2013)

4 .1.3.Education level of household heads

Education in general can be defined as accumulation of knowledge and experience to prepare an individual for live (Ali, 2008). The results of the surveyed household heads revealed that about 27% of household heads were illiterate, 13% received khalwa education, and 31% primary school, 21% secondary school, and 8% of households head received university education See figure 4.3 .The illiterate rate between the surveyed females households head was relatively higher than the male household heads. Between the 31 male household head the percentage of illiterate households heads was 65 % ,

while between the 17 female households heads the illiterate household heads were 35 %

Figure 4. 3: Education level of household heads.

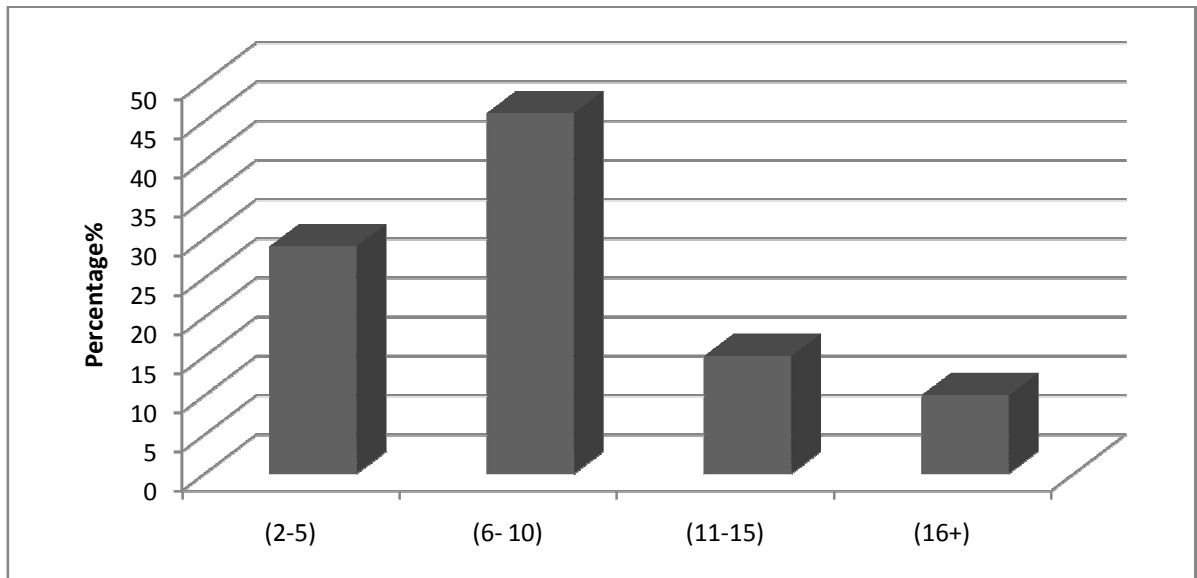


Source : Field survey, (2013)

4.1.4 Family size

Family can be defined as all members living in a house and having a blood relationship and supported by family income. (Sitar, 2010). The average number of persons in of the surveyed households was 6 persons per household. The family size ranged between size between the surveyed 2 as the lowest number of the family size between the surveyed households and 16 as the highest number of the family size members. The household with a family size of (6-10 persons) represent 46% of the households. Households with the number of the family ranging between (2-5) represented 29% of the surveyed families. Surveyed households with family size that range between (6 -10) persons per family represented 46% of the families. Families with (11 – 15) persons per family represented 15% of the surveyed families. Families with family members that are 16 and over represented 10% of the surveyed families. See figure 4.4.

Figure 4. 4: Distribution of families according to the Family size



Source: Field survey, (2013)

4.1.5 Main occupations of household heads:

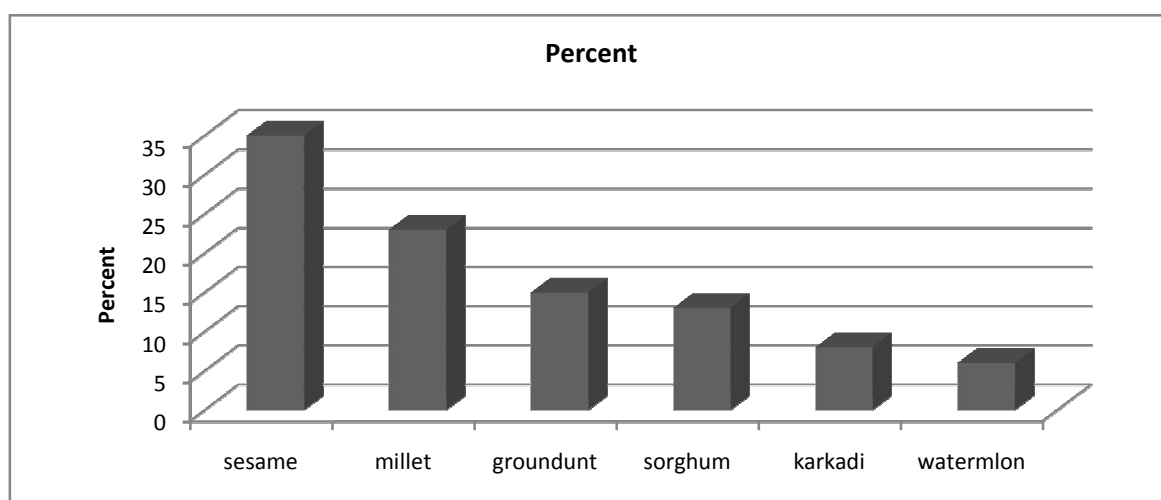
Agriculture represented the main source of income for the surveyed household heads. Between the surveyed household heads 88% said their main occupation is farming, while 12% have different occupations. Government employees represented 5%, and village's traders represented 4% and other represented 3%. This reveals that the majority of the surveyed household's heads are mainly agricultural producers of crops and livestock crops. Dependence on agriculture as the main occupation may be a major source of income variability. This is due to the fact that the area is under drought farming which is highly affected by the climatic conditions.

4.1.6 Farm income:

The farm income represents the income generated from selling different agricultural products produced within the farm. Sesame was considered as the main cash crop in the study area as well as millet as the main staple food crop. Findings of the study revealed that 37% of the household's heads on average receive 35% of their farm income from sesame.

Groundnut represents 28% of the income generated from agriculture to 15% of the household heads. Between the surveyed households head 13% receive 16% of them from income from millet crop. Farm income from sorghum represented 19% of the income of 23% of the household's heads. Karkadi crop represented 6% of the farm income to 8% of the household's heads. For 6% of the surveyed household's heads water melon represented 4% of their farm income.

Figure 4. 5: Farm income:



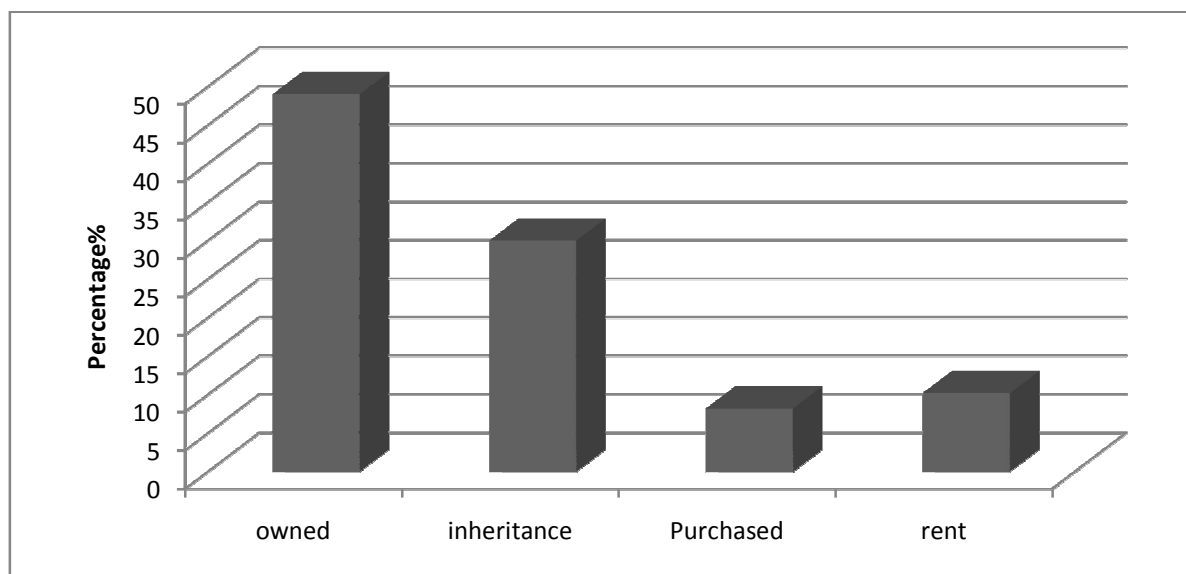
Sources field survey, (2013)

4.2 Land ownership and use:

4.2.1 Land ownership:

The findings of the study revealed that the majority of household in the area owned land. About 49% of the responded household heads mentioned that they owned land through long use ,30% through inheritance , and 8% asserted they purchased the land they cultivated 10% of respondents said they rent land from others. Those who rent land either they have no owned land in the village, or the size of their land is very small as a result of disintegration of inheritance land to small sizes.

Figure 4. 6: Land ownership

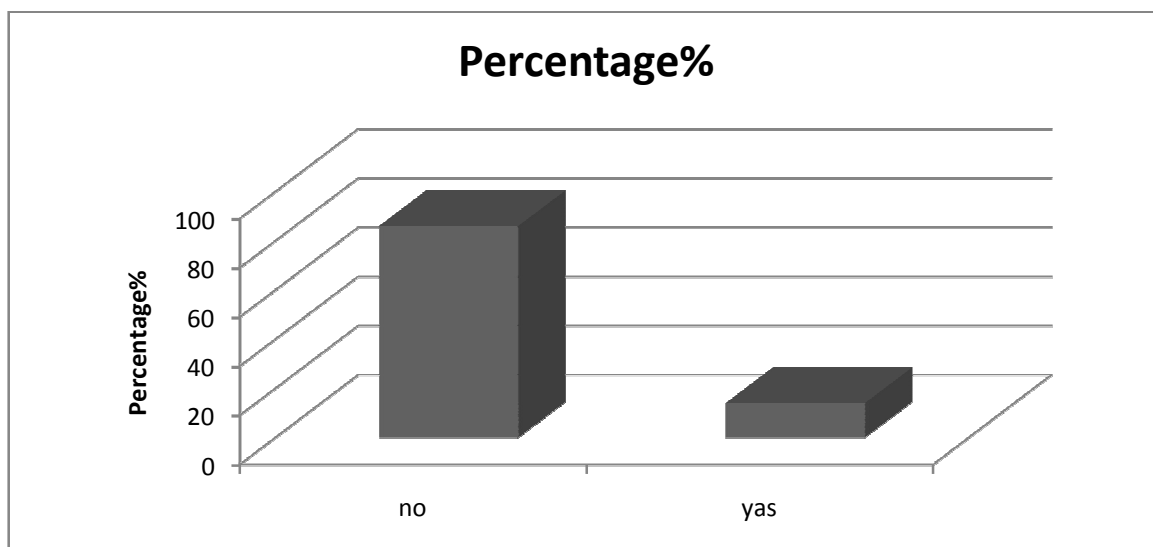


Source: field survey, 2013

4.2.2 Land registered in shikan locality, NKS:

The study showed that land about 86% of households heads interviewed said that the land they cultivate is no registered , while 14% of farm land has been registered.

Figure 4. 7: land registered in shikan locality, NKS

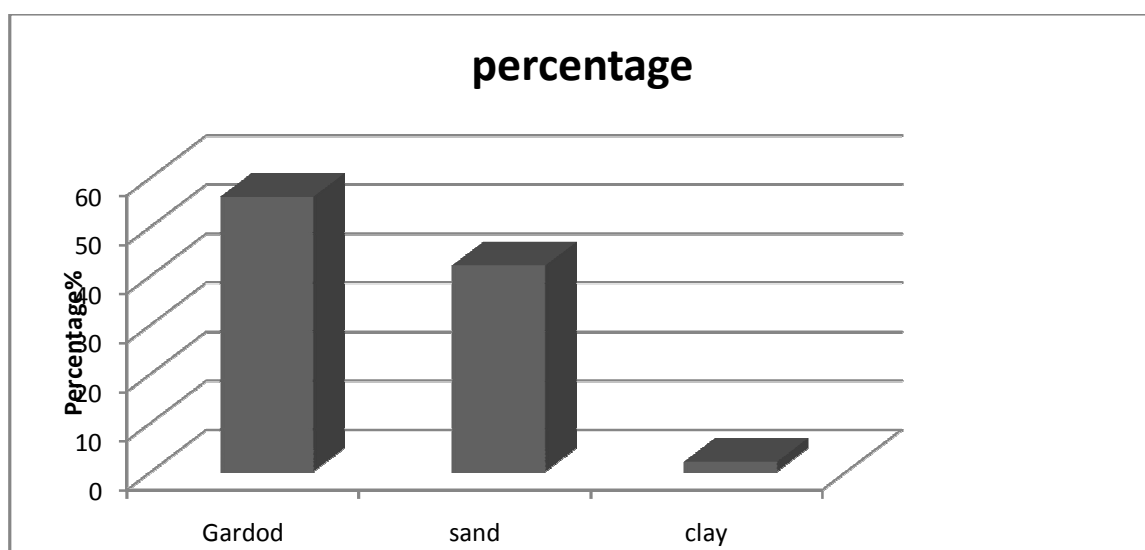


Source: field survey, 2013

4.2.3 Type of soils:

Soil is the most important resource and factor of production in the agricultural production for crop production and animal raising . The survey results showed that 55% of soil type is Gardod, 41% sand, while 1% is a mixtune clay soil.

Figure 4. 8: Type of soil



Source : field survey ,2013

4.2.4 Gupraka land:

The gupraka is an area of land attached house. Finding of the study showed about 83 %of responded household's heads said that they own no land gupraka, whine 17% of responded household's heads said that they have gupraka land. The gupraka is usually cultivated by females within the family. Crop grown in Gupraka are normally vegetable crops and legumes.

4.3 Agricultural activities:

4.3.1 Crops sowing:

The rainy season in the study area normally start by the end of May and stop by about mid October. Percentage of the farmers sow their millet crop detest at the beginning of May. They land to plant theirs crop cultivate is known locally as Elremail method beginning of the rainy season. Sorghum is planted at the mid of June. Other crops are grown them at July. Due to the vulnerability of the rains quantities and duration farmers may reseed their crops because of failure of germination. During 2013/14 season 39% of farmers repeated seeding their crops. The reasons sighted for reseeding were low rains or attacks by pests and diseases. 61% %of farmers don't repent cultivating crops.

4.3.2 Shifting cultivation:

Shifting cultivations practiced in the area by some of the farmers. 27% of the surveyed household heads said they practice shifting cultivation, while 73% of the farmers continue to cultivate the same area.

4.3.3 Agricultural rotation:

Farmers in the study beside they low capital intensive agricultural precious, do net look after soil fertility . Between the household heads

surveyed 67 % said they tend to cultivate the same piece of land year after year.

5.3.4 Cultivated crop in season 2013:

The survey shown that on the average the area under millet 1.85 was 0.199% of the total area cultivated season 2013/14. Productivity of the millet for the surveyed household season 2013/14 was 1.46 sacks. This is lower than the Productivity of millet for NKS witch was 0.075. Average area of sorghum 1.66 was 0.178% of the total area cultivated 2013/14. Productivity of the sorghum for the surveyed household season 2013/14 was 1.75 sacks. This is lower than the Productivity of sorghum for NKS witch was 0.128

Average area of groundnut 1.78 was 0.19% of the total area cultivated 2013/14. Productivity of the groundnut for the surveyed household season 2013/14. This is lower than the Productivity of groundnut for NKS witch was 0.209.

Average the area sesame 2.86 was 0.31% of the total area cultivated 2013/14. Productivity of the sesame for the surveyed household season 2013/14 was 0.067 Gunter. This is lower than the Productivity of sesame for NKS witch was 0.061. Average the area of Watermelon 0.312 was 0.033% of the total area cultivated 2013/14. Productivity of the Watermelon for the surveyed household season 2013/14 was Gunter. This is lower than the Productivity of Watermelon for NKS 0.049.

Average the area Karkade 0.86 was 0.09% of the total area cultivated 2013/14. Productivity of the Karkade for the surveyed household season 2013/14. This is lower than the Productivity of Karkade for NKS witch was 0.049.

Table 4.1 shows the total area and total production of the crops grown by surveyed households during season 2013/14.

Table 4. 1: Household surveyed season 2013/14.Average area, and production

crops	Area cultivated /Mukhams	Unit	Percentage	Production	Productivity
Millet	1.85	Sacks	0.198562	2.7	1.45945946
Sorghum	1.66	Sacks	0.178169	2.9	1.74698795
Ground nut	1.78	Gunter	0.191049	3.07	1.7247191
sesame	2.86	Gunter	0.306966	5.82	2.03496503
Watermelon	0.312	Gunter	0.033487	.750	2.40384615
Karkade	0.855	Gunter	0.091768	2.1	2.45614035
Total	9.317				

Source: field survey ,2013

4.4 Livestock production:

Livestock is the second main activity in the area besides farming. People in the study area raise considerable numbers of sheep, goats, and fewer numbers of cattle and camels. About 13% of household heads studied confirmed that they practice animal raising as secondary activity, while 87% of household heads confirmed that they do not involve in significant animal raising activity. However almost all household practice some kind of house animals raising like goats, sheep have and chickens. poor pastures and shortage of water are the main problems. Confronting livestock in the study area as mentioned by respondents. Pastures are poor in season due to the rain variability and increase in livestock numbers. Livestock production system in area traditional open system of livestock production is a dominant in all the area of shichan locality , North Kordfan State . See table 4.2

Table 4. 2: Average number of livestock own by surveyed households

Animals	Number animals
goats	5
sheep	7
Cattle	1
Chicken	7

Source: field survey, 2013

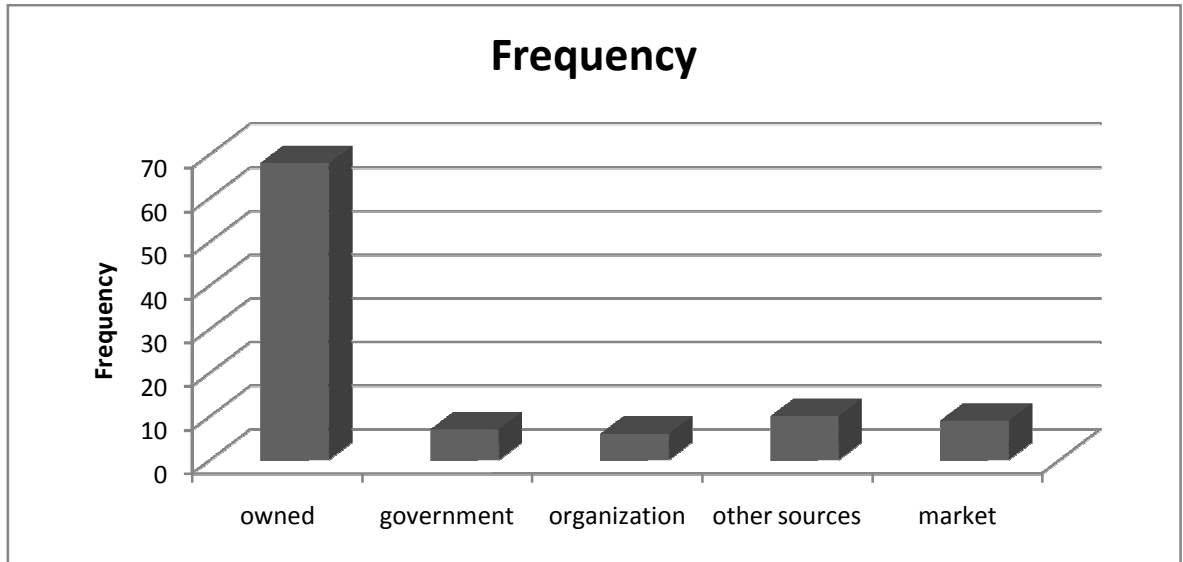
4.5. Input used:

4.5.1 Sources of seeds:

The main source of crop seeds are the farmers own seeds, as 68% of the household heads surveyed they said they used their own seeds. of farmers were owned the seeds 7% household heads brought their seeds form the government, 6% said they get there seeds from organization ,9% from the market and 10% of them were farm other sources. See figure 4.13 . 96 % of

the surveyed farmers used local seeds and 4% used improved seeds. See figure 4.9.

Figure 4. 9: Sources of seeds of household head surveyed in Shikan locality, NKS



Source: field survey, 2013

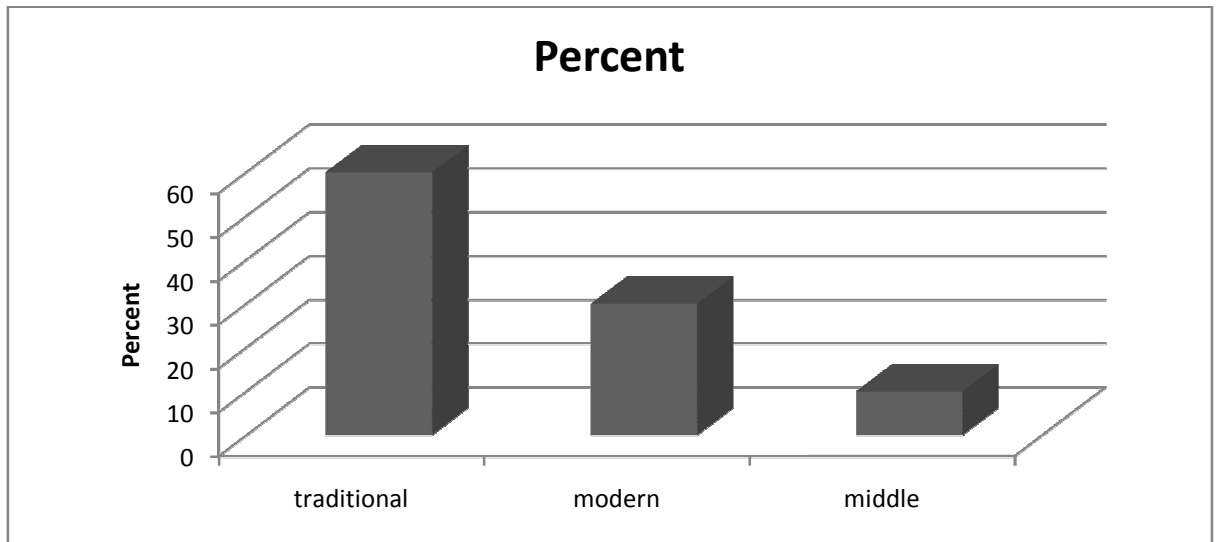
4.5.2 Fertilizers sources:

The farmers in traditional rain fed areas of the Sudan generally do not use fertilizers. In the study area the household heads surveyed use no chemical or organic fertilizer. This might be on of the reason for low crop yields. Farmers in the study area use shifting cultivation as a means of regenerating soil fertilizer. 93% of the surveyed household heads don't use any sort art. Fertilizers, 7%of don't use any Fertilizers.

4.5.3 Implements used:

The farmers in the study area are traditional low capital intensive farmers. Tractor is used irregular by 30% of the farmers surveyed. Use of tractors in such areas is not advisable as it may lead to land deterioration and desertification. Between the farmers surveyed 14% use traction. All the farmers surveyed use hand tools in the cultivation of crops.

Figure 4. 10: Implements used in shikan locality, NKS



Source: field survey, 2013



Source: field survey 2013.

Plate 1: Traditional Crop Weeding



Source: field survey 2013.

Plate 2: Animal traction



Plate 3: Chesil plow

4.6 Agricultural finance in Shikan locality:

Formal finance is not available in the study area. Village traders deliver some kind of short term traditional finance especially for weeding and other harvesting necessities. Also people in the area borrow from relatives in emergency cases. The study revealed that about 12 % of the interviewed household said that they borrowed some amount during last year's either from village traders or relatives. While about 88 % of studied household heads affirmed that, they did not borrow any amount in the last years. The type of finance is known as (Sheall). Sheall is a type of finance in which villages traders buy crops especially sesame and groundnut from farmers before harvesting season. Traders pay now and receive the crop after the success of agricultural season. Sheall prices are usually lower than harvesting season prices. However during the harvest season in 2013, the price of sheall and harvesting season price were almost the same.

4.7 Marketing in Shikan locality:

The term agricultural marketing is composed of agricultural and marketing services. Agricultural means activities aimed at the use of natural resources for human welfare, while marketing denotes series of activities involved in the creation of time, place, form and possession utility (Ayul, 2009).

In the study area it is evident that, there is no market information and within the same village market price may differ depends on quantities which supplied by producers for sale. Some farmers sell part from their sesame, ground nut and millet while they were harvesting to meet their needs and harvesting cost or sell after harvesting directly for the same reason. This system is locally called sheal and almost practiced by the villages traders.(field survey, 2013).

There are a number of rural markets scattered all over the locality and each of them has a certain day for selling and buying for sesame, ground nut and millet. Village traders purchase sesame, groundnut and millet directly from farmers on any day at prices always less than the town market prices. However the table (4.3) shows that 67% of household heads intervened marketed their crops in the villages markets, while only 13% at farm whereas 15% products in town market and 6% central market. See table

Table 4. 3: Marketing place

Marketing place	Percentage %
villages markets	67
farm	13
town market	15
central market	6

Source: field survey, 2013

4.8 Agricultural labor in Shikan locality:

In the Shikhan locality, North Kordofan State, three types of labor involved in performing The traditional agricultural operation: family labor, hired labor and "Nafir" labor.

1. Family labor

Is used here to define the labor resource provide by any of the household members. Historically and traditionally this is the main source of labor available to the household. Labor contributed by this category is not paid directly, but rather is compensated by return to the whole household.

2. Hired labor

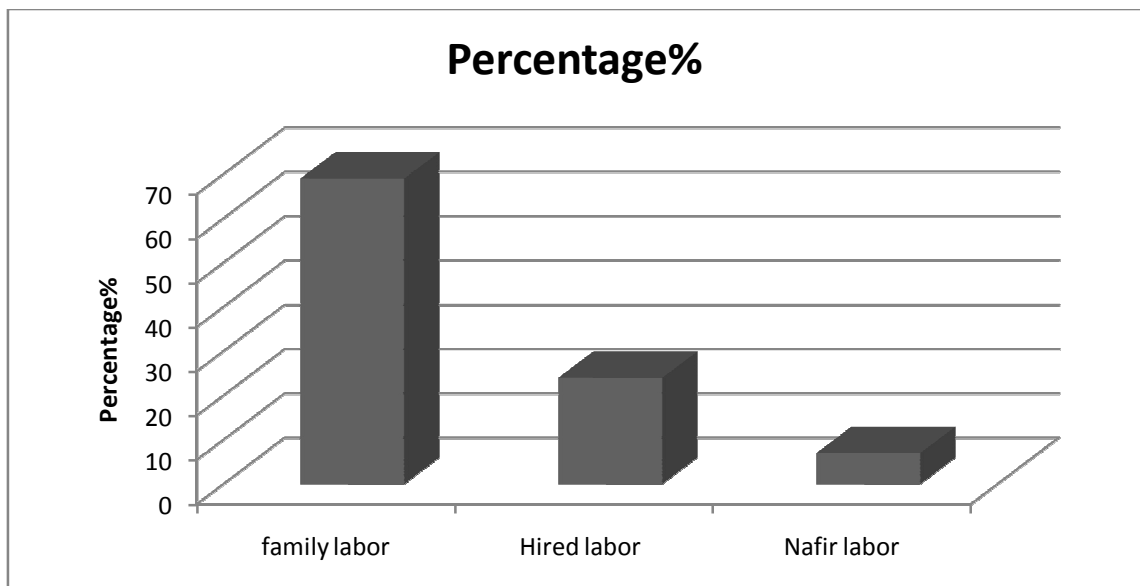
This is category refers to that part of the labor which is governed essentially by a market institution. It is this source of labor, which a farmer can rely on for needs beyond the available family labor, being constrained

probably only by his operating and cash resources. Unlike "Nafir" labor, which tends to be employed mainly in the labor intensive operation (e.g., weeding and harvest), hired labor is employed in the whole range of the agriculture operation .Payment of hired labor is usually on a cash basis; however Payment might include an in-kind component (food and drinks).

3. Nafir labor

Nafir (cooperation or exchange labor) is one the traditional aspects of the Shikhan society .This cooperative institution is prevalent in many parts of the Sudan and many other African countries. Its cooperative nature markets it suitable to labor intensive activities, especially those with a short time span. That is why no direct wage is paid for the group participating in the Nafir, but a farmer provides a meal (food and drinks) for his fellow villagers who provide labor. Results of the survey showed that types of labor 69% household heads family labor, 7%Nafar labor and 24% hired labor.

Figure 4. 11: Types of labor household heads in used farming by the surveyed Shikan locality



Source: field survey ,2013

Cost of crops production:

In Shikhan locality, the cost of production of crops production can be itemized in to:

Table (4.4) shows the average total cost of production per mukames for crop production in Shikhan locality for 2013 Cultural.

From the table total cost of production per mukames of crops production for the Shikhan locality was SDG total. From the table, it the clear that inputs crop production.

Pre harvest operations:

Including Land preparation, seeds, agricultural, re agricultural, first weeding and second weeding. The cost of harvesting was about 333 of the total cost in Shikhan locality.

Table 4. 4: Average cost of production per mukames for selected crops production in shikan locality 2013/ 2014 (value in SDG/mu)

crops	Land cleaning	seed	agricultural	re agricultural	First weeding	Second weeding	total
Millet	36	13	25	6	120	60	260
Sorghum	27	12	16	50	97	83	260
Ground nut	20	19	14	27	122	90	260
sesame	23	21	21	20	147	73	260
Watermelon	32	21	21	27	120	70	260
Karkade	25	25	20	35	120	85	260

Post harvesting operations:

Including cutting, collecting, transport, and sacks. The cost of harvesting was about 333 of the total cost in Shikhan society

Table 4. 5: Average cost of harvesting per mukames for crops production in shikhan locality for the 2013season in Sudanese pound (SDG/mu)

crops	Cutting and collecting	Sacks	transport	transport	total
Millet	38	5	4	5	52
Sorghum	27	5	4	5	41
Ground nut	33	5	3	3	44
sesame	38	5	3	5	51
Watermelon	28	5	3	5	41
Karkade	25	5	3	4	37

Gross margin analysis:

The type of budget provided in the Farm budgets and costs section is the gross margin budget. A 'gross margin' is the gross income from an enterprise less the variable costs incurred in achieving it. It does not include fixed or overhead costs such as depreciation, interest payments, rates, or permanent labor. The gross margin budgets are intended to provide a guide to the relative profitability of similar enterprises and an indication of management operations involved in different enterprises

A gross margin can be defined as the gross income from an enterprise less the variable costs incurred in achieving it.

Gross margin = Revenue – total variable costs

Production cost:

Production cost is of producing a certain amount of product in a particular time period. For the purpose of calculating production cost certain item are to be determined. These include Variable cost The average

production cost of crops production and its yield, price and gross margin are shown in table.

Table 4. 6: Average Returns per mukhamas for Selected crops for Surveyed Household heads, Shikan Locality

crop	Average yield per mukhmas per unit	Average price per unit	Average Returns per mukhmas
Millet	1.26	550	693
Sorghum	1.41	480	676
Groundnut	1.62	450	729
Sesame	2.05	390	799.5

Table 4. 7: Millet Gross margin per mukhamas

Returns per mukhmas	693	
Variable Cost		
Land Cleaning	36	
seed	13	
agricultural	25	
re agricultural	6	
First weeding	120	
First weeding	60	
Cutting and collecting	38	
Sacks	5	
Village transport	4	
markets transport	5	
Total cost	276	
Gross margins	417	

Table 4. 8: Sorghum Gross margin per mukhamas

Returns per mukhmas	676	
Variable Cost		
Land Cleaning	27	
seed	12	
agricultural	16	
re agricultural	50	
First weeding	97	
First weeding	83	
Cutting and collecting	27	
Sacks	5	
Village transport	4	
markets transport	5	
Total cost		299
Gross margins per mukhmas		377

Table 4. 9: Groundnut Gross margin per mukhamas

Returns per mukhmas	729	
Variable Cost		
Land Cleaning	20	
seed	19	
agricultural	14	
re agricultural	20	
First weeding	122	
First weeding	95	
Cutting and collecting	35	
Sacks	5	
Village transport	3	
markets transport	5	
Total cost	318	
Gross margins per mukhmas	411	

Table 4. 10: Sesame Gross margin per mukhamas

Returns per mukhmas	799.5	
Variable Cost	23	
Land Cleaning	21	
seed	21	
agricultural	27	
re agricultural	147	
First weeding	73	
First weeding	38	
Cutting and collecting	5	
Sacks	3	
Village transport	5	
markets transport	23	
Total cost	340	
Gross margins per mukhmas	459.5	

The study revealed that unavailability of production inputs (improved seeds, fertilizers and labors) leads to high production costs. Marginal revenues analysis showed that high production cost was high for sesame then groundnuts, sorghum and millet respectively. Sesame also had a high profitability then groundnuts, millet and sorghum.

CHAPTER FIVE

SUMMARY AND RECOMMENDATIONS

5.1 Summary

Agriculture is considered as the main activities for majority of people in the study area. Animal production, traditional farming and raising livestock are the major problem facing the farming. The main objective is assessed and calculates the economics of agricultural production Shikan locality. While other secondary objective is describe the farming system in the study area. Describe labor utilization in traditional rain fed agriculture sector. Cost of crop production in the study area.

The study used both quantitative and qualitative data. A field survey was conducted in April 2013 using questionnaire. Group discussion, interviews and observations were also used in data collection. 48 households were chosen using simplified random sampling techniques. Descriptive statistics and analysis of gross margin. Results of study revealed that 64 % of studied household heads were male, while 36 % were female. Age of household heads ranged between 23 -75 years with average of 53 years old. About 27 % of household heads were illiterate, 13% received Khalwa education and 70% household heads received formal education. Family size ranged from 6-10 persons with an average of 7 persons per household. Males represent 64 % of the studied household: while female represent 36%. The study showed that about 88% of the household heads considered farming as their main activity, considered it as secondary activity 12 %. The people in the area raise sheep, goats, and cattle. About 13 % of studied household heads practiced animal raising for cash as a secondary activity, while 87 % said animal raising was only for home consumption. Findings the study area showed that about 35% of household interviewed had part their income was

generated from sesame production,. 23% of household surveyed had part of their income generated Sorghum production ,15 % of them had part of their income generated groundnut,13% of the them had part of income millet .8% of them had part of income resulted from karkadi production ,and 6% of them had part of income generated watermelon. The study showed that about 49% of the responded household heads mentioned that they owned land ,30% inheritance, and 8% asserted they purchased their land 10% of respondents said they rent land from others Results of study revealed that 86% of households interviewed said that the land they cultivate is, while 14% of farm land has been registered. The survey results showed that 55% of soil type is Gardod, 41% sand, while 1% is a mixture clay soil. The study revealed that about 12 % of the interviewed household said that they borrowed some amount during last year's either from village traders or relatives. While about 88 % of studied household heads affirmed that, they did not borrow any amount in the last years. The type of finance is known as (Sheall). The study showed that about 67% of household heads intervened marketed their crops in the villages markets, while only 13% at farm whereas 15% products in town market and 6% central market

The study revealed that unavailability of production inputs (improved seeds, fertilizers and labors) leads to high production costs. Marginal revenues analysis showed that high production cost was high for sesame then groundnuts, sorghum and millet respectively. Sesame also had a high profitability then groundnuts, millet and sorghum.

The study recommended using animal traction in Gardod lands to facilitate cultivation and harvesting, availability of production inputs and finance and solving marketing problems.

◦.2 . Recommendations

- Increase in per-capita productivity of the people through improved technological innovation.
- Provision of improved agricultural practices in order to yet the Farmers out of the visions circle of traditional farming .
- Provision of agricultural finance to facilitate the use of improved agricultural practices .
- The study recommended using animal traction in Gardod lands to facilitate cultivation and harvesting.
- Availability of production inputs and finance and solving marketing problems.

References

- Abdalla, A. A. H. O. Abdelgadir (2001). The Agricultural Potentials of Sudan. Executive Intelligence Review, pp 37-45.
<http://www.larouchepub.com/eirtoc/2001/eirtoc808.html>.
html.www.aboutsudan.
- Ali Amira E l Rahim, (2008) Economic analysis Affecting wheat productivity in Zeidab Scheme in the River Nile State Sudan. Sudan University of Technology.
- Ali, A. G. K., (2007). Description and Analysis of Farming System in South Kordofan .Sudan University Of Technology.
- Ali, H. El., (2008). Effect of Price Liberalization Policy on Instability and Growth of Agricultural Production Sudan. Sudan University of Science and Technology.
- Ayul, J. T. (2009). Principles of agricultural marketing faculty of Agricultural. Upper Nile University. Khartoum. Sudan.
- Bertelsmann Stiftung's Transformation Index report (BTI) 2012. More on the BTI at <http://www.bti-project.org>
- Elemo. K. A. (2012). Farming system Department of Plant Physical and Crop Production- Nigeria.
- Food And Agricultural Organization Of The United Nations (2011). Role of woman in agriculture. Sudan Working Paper No 11-02
<http://www.fao.org/docre/013/am307e/am307e00>.
- Food and Agricultural Organization of the United Nations (2011). Farming Systems Report Synthesis of the Country Reports at the level of the Nile Basin. Rome.

- Khiry Manal Awad (2007). Spectral Mixture Analysis for Monitoring and Mapping Desertification processes in sem-arid Area North Kordofan State. Sudan. Ph. D. thesis, Germany, Dresden, 10-19.
- Ministry of Agricultural and Animals Resource, (2012).
- Ministry of Agricultural and Animals Resource, (2000-2013). Agricultural survey of seasons assessment- Sudan.
- Siddig Khalid H. A. (2011). Oil and Agriculture in the Post-Separation Sudan. Agricultural Economics Working Paper Series. University of Khartoum.
- Siddig Khalid H. A. and Babiker (2011). Agricultural Efficiency Gains and Trade Liberalization in Sudan. Agricultural Economics Working Paper Series. University of Khartoum.
- Sitar Mohamed Ibrahim (2010). Economic Effect of Groundnut Cultivation on farmer's income Enhod locality North Kordofan State Sudan University of Technology.
- Sudanese Central Bureau of statistics (SCBS) (2009). Sudanese five National Censuses. Khartoum.
- Warsame Mohamed sharif(2010). Temporal Analysis of Sesame marketing price in the Sudan. Sudan University of Technology.

Appendices

بسم الله الرحمن الرحيم

جامعة السودان للعلوم و التكنولوجيا

كلية الدراسات العليا

دراسة عن التحليل الاقتصادي للانتاج الزراعي واستخدامات العمالة - ولاية شمال كردفان - محلية شيكان

دراسة لنيل درجة الماجستير في الاقتصاد الزراعي

رقم الإستمارة: التاريخ: القرية:

١. معلومات عن رب الاسرة

اسم رب الأسرة:

أ. العمر: النوع: (١) ذكر (٢) أنثي

ب. مستوي التعليم: (٠) أمي (١) خلوه (٢) (تعليم نظامي) عدد سنوات الدراسة:

ج. كم يبلغ دخلك السنوي بالتقريب جنيه

د. عدد أفراد الاسرة : ذكور: أناث:

٢. مهنة رب الاسرة

المهنة	(١) أساسية	(٢) ثانوية	الدخل السنوي
زراعة			
رعي			
تجارة			
عامل			
موظف			
اخرى (حدد)			

٣. الارض

أ. المساحة الكلية () مخمس

ب. كيف تم الحصول عليها: (١) ورثة (٢) شراء (٣) ملك (٤) ايجار

(٥) اخرى حدد

ج. اذ كانت الارض شراء كم القيمة نقداً في اي عام تم شراءها.....

د. نوعية التربة (١) رملية (٢) طينية (٣) قردود (٥) اخرى حدد

ه. كم عدد القطع الزراعية التي تملكها

وهل توجد جباركة (١) نعم (٢) لا

كم تبلغ مساحتها

ز. هل الارض التي تزرعها خالية من النزاع (١) نعم (٢) لا

م . هل الارض الزراعية مسجلة (١) نعم (٢) لا

ز . هل توجد مسارات للرعى (١) نعم (٢) لا

٤. الزراعة

أ . تاريخ بداية الزراعة

نوع المحصول	الدخن	الذرة	الفول السوداني	السمسم	حب البطیخ	الكردي	اللوبياء	البامية
تاريخ بداية الزراعة								

أ. هل تمت الزراعة اكثر من مره (١) نعم (٢) لا

ب . اذا كانت الإجابة بنعم ماهي اسباب تكرار الزراعة

ج . كم تبلغ المسافة بين أبعد مزرعة لك والمنزل بالتقريب

د . هل تزرع اكثر من محصول فى نفس المساحة (١) نعم (٢) لا

هـ . هل تمارس الزراعة المتنقلة (١) نعم (٢) لا

و . هل هنالك دورات زراعية (١) نعم (٢) لا

ز . الدورات كل كم

ما هي المحاصيل التي تزرعها والمساحة لكل محصول والانتاج للموسم ٢٠١٣

م	المحصول	المساحة المزروعة بالمخمس	المساحة المحصودة	وحدة الانتاج	الكمية المنتجة	الكمية المباعة	متوسط السعر
١	دخن جوال						
٢	فول سوداني قنطار						
٣	ذره جوال						
٤	كردي قنطار						
٥	ويكة ملوة						
٦	صمغ عربي قنطار						
٧	بطیخ قنطار						
٨	سمسم قنطار						
٩	اللوبياء قنطار						
١٠							

المحاصيل التي زرعت في الجبراكه (ان كانت موجودة)

م	المحصول	الانتاج	الوحدة	من قام بالعمالة
---	---------	---------	--------	-----------------

أ. ماهى المحاصيل التى زرعتها اخر موسم ٢٠١٣

.....

ب. ماهى المحاصيل التى كنت تزرعها وتوقفت عنها

.....

ج. ما هى الاسباب التى جعلتك تتوقف عن زراعتها

.....

د. هل قمت بزراعة محاصيل جديده لم تكن موجوده (١) نعم (٢) لا

ه. ما هى الاسباب التى جعلتك تقوم بزراعتها (١) ملائمة التربة (٢) فترة الانبات قصيرة
 (٣) احتياجاتها المائية بسيطة (٤) اخرى حدد

و. خلال ٥ سنوات الماضية هل كانت هنالك زيادة اونقص فى عدد المحاصيل التى تزرعها؟

(١) نعم (٢) لا

اذا كانت الاجابة بنعم ما هى الاسباب ١. ٢. -----
 ٣. ----- ٤.

٧. أنواع المحاصيل البستانية إذا وجدت

.....

٨. هل لديك جنينة هشاب للانتاج الصمغ العربى (١) نعم (٢) لا

ب. كم تبلغ مساحتها الكلية.....

ج. هل هى ملك (١) خاصة (٢) مجموعة

د. خلال الخمسة سنوات الماضية هل كانت جنينة الهشاب؟ (١) موجودة (٢) غير موجودة

أن كانت موجودة هل تحصل منها على صمغ؟ نعم لا

اذا كانت الاجابة بنعم كم تحصل منها؟ ----- جنيه

٥. مدخلات الانتاج

نوع التقاوى المستخدمة (١) محلية (٢) محسنة

مصادر التقاوى (١) ذاتي (٢) جهات حكومية

(٣) منظمات طوعية (٤) السوق (٥) أخرى حدد.....

هل تستخدم اسمدة (١) نعم (٢) لا

ما هي انواع الاسمدة التي

تستخدمها.....

.....

ما هي نوع المبيدات التي

تستخدمها.....

هل استخدمت الات حراثة (١) نعم (٢) لا

اذا كانت الاجابة بنعم ما هي الالات المستخدمة

(١) آلات حديثة (٢) آلات وسيطة (٣) آلات تقليدية

(٤) اخرى حدد.....

٦. المعلومات الزراعية

من اين تحصل على المعلومات الزراعية (١) من المرشدين المحليين

(٢) من النشرات الارشادية (٣) الاذاعة وتلفاز (٤) اخرى حدد.....

٧. التمويل

هل تحصل على تمويل (١) نعم (٢) لا

ما نوع التمويل (١) ذاتي (٢) قرض من البنك (٣) تمويل

بالشيل

(٤) اخرى حدد.....

ما هي المحاصيل التي اخذت لها

تمويل.....

.....

هل اخذت تمويل في السنوات الماضية (١) نعم (٢) لا

اذا كانت الاجابة بلا ما هي

الاسباب.....

.....

٨. تربية الحيوان

بجانب الزراعة هل تقوم بتربية الحيوان (١) نعم (٢) لا

النوع	عدد الحيوانات	متوسط السعر بالجنيه
الماعز		
الضأن		
الأبقار		
الابل		
الدواجن		

كيف يتم الحصول على الاعلاف

(١) من المزرعه (٢) السوق (٣) اخري حدد

هل هنالك اى عمليات تحسين ادخلت علي الثروة الحيوانية (١) نعم (٢) لا

اذا كانت الاجابة نعم ماهى الانواع التى تم تحسينها

.....

تكاليف الحيوانات (جنيه)

الحيوان	تكلفة العلف	تكلفة العلاج	تكلفة الرعي (ان وجد)	الجملة

٩. تكاليف الإنتاج (جنيه)

المحصول	المساحة	النظافة	التقاوى	الزراعة	الرقاعة	الحشة الاولى	الحشة الثانية	الجملة

								الدخن
								الذرة
								السمسم
								حب البطيخ
								الكركدى
								القول السودانى
								اللويبا
								البامية
								الصمغ العربى

١٠. عمليات ما بعد الحصاد

المحصول	المساحة	القطع واللم	الدق والتزرية	الخيش	الترحيل للقرية	الترحيل للسوق	زكاة	اخرى (تحدد)
الدخن								
الذرة								
السمسم								
حب البطيخ								
الكركدى								
القول السودانى								
اللويبا								
البامية								
الصمغ العربى								

١١. العمالة في المزرعة

ا. نوع العمال المستخدمة (١) اسرية (٢) مؤجرة (٣) نفير

ب. الاعمال التى تقوم بها النساء والاعمال التى يقوم بها الرجال

طبيعة العمل	ذكور	اناث	مشترك

ج . عدد العمالة الاسرية التي اشتركت في العمليات الزراعية موسم ٢٠١٣-٢٠١٤

الدخن	المساحة	النظافة	تيراب	الرقاعة	الحشة الاولى	الحشة الثانية	القطع واللم	الدق والتزرية	الجملة
عدد الايام عمالة الاسرة									
عدد الايام العمالة المؤجرة									

الفول السوداني

الفول السوداني	المساحة	النظافة	تيراب	الرقاعة	الحشة الاولى	الحشة الثانية	القطع واللم	الدق والتزرية	الجملة
عدد الايام عمالة الاسرة									
عدد الايام العمالة المؤجرة									

السهم

السهم	المساحة	النظافة	تيراب	الرقاعة	الحشة الاولى	الحشة الثانية	القطع واللم	الدق والتزرية	الجملة
عدد ايام عمالة الاسرة									
عدد ايام العمالة المؤجرة									

توزيع المحاصيل وبقايا المحاصيل من المزرعة

المحصول	الانتاج	التسويق	الكمية
---------	---------	---------	--------

المستهلكة للاسة	العائد الكلي	سعر الوحدة	الكمية	الوحدة	الكمية المنتجة	
						مثلا الدخن
						التبن من الدخن

توزيع المحاصيل من الجبراة

الكمية المستهلكة للاسة	الكمية التسويق			الانتاج		المحصول
	العائد الكلي	سعر الوحدة	الكمية	الوحدة	الكمية المنتجة	

الحيوانات

استهلك الاسرة	العائد من البيع	الكمية المباعة	نوع الحيوان

منتجات الحيوانات

استهلك الاسرة	العائد من البيع	الكمية المباعة	نوع المنتج الحيواني

١٢. التسويق الموسم الحالى ٢٠١٣م (الاسعار بالجنيه)
النافذة التسويقية

١. المزرعة ٢. سوق القرية ٣. سوق المدينة ٤. سوق مركزى

ب. الية البيع

١. تاجر الجملة ٢. تاجر المحلى ٣. تاجر التجزئه ٤. المستهلك مباشرة ٥. بنك

ب. هل كل سنة تقوم ببيع المحاصيل (١) نعم (٢) لا

ج. هل السعر للمحاصيل مجدى (١) نعم (٢) لا

جامعة السودان للعلوم و التكنولوجيا

كلية الدراسات العليا

دراسة عن التحليل الاقتصادى الانتاج الزراعى واستخدامات العمالة - ولاية شمال كردفان -
محلية شيكان

دراسة لنيل درجة الماجستير في الاقتصاد الزراعي

دليل الأسئلة للمجموعات المختارة بالمجتمع

١. كم عدد الأسر بالقرية؟
٢. كم يبلغ عدد سكان القرية/ المدينة؟
٣. ماهي الموارد الطبيعية الموجوده بالمنطقة؟
٤. هل هنالك تصحر فى المنطقة فى السنوات الماضية؟
٥. هل توجد مشكلة عمالة بالمنطقة؟
٦. ماهي المشاكل والمعوقات التي تواجه الزراعة بالمنطقة وماهي اسبابها؟
٧. مامدي توفر خدمات التمويل بالمنطقة وما هي انواعها؟
٨. هل يوجد تمويل بالشيل بالمنطقة؟
٩. هل هنالك تتدخل للايات الزراعية بالمنطقه؟
١٠. هل توجد هجرة عمالة الى مناطق التعدين الأهلى بالمنطقة؟
١١. ماهى مصادر المياه بالمنطقة؟
١٢. هل تشكل العمالة الزراعية مشكلة؟