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Agricultural Development Policies in the Nuba Mountains- Sudan and its Assessment in the Context of Empowerment Approach

1960 - 2012

سياسات التنمية الزراعية في جبال النوبة– السودان: وتقويمها في إطار منهج التمكين 1960–2012

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DEDICATION

I dedicate this work to the souls of my parents , my wife Zahra Giberel, and my children; Rabab, Fayadh, and Ashraf.

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ABSTRACT

The study aims at investigating the causes behind the economic difficulties facing small holder farmers and their households. Why life of small farmers faces economic difficulties, while their land is rich of agricultural potentials?

Accuses are directed to government agricultural interventions policies to stand behind economic difficulties of the farmers in general and small farmers in particular.

The main study hypothesis, is that agricultural policies are inadequate to empower small farmers . Also, farmers do not make the necessary farm investments because they don't have finance. Furthermore, resources of the area are miss-allocated by agricultural intervention policies.

The methodology used to treat the problem is analytical and descriptive. Primary source using questionnaire as the main study tool for data collection, is the basic source of the study. However, secondary source is also used to collect some necessary data. In processing and analyzing the data , the study used(SPSS).

Of the main findings; that public services are not provided sufficiently to small farmers. Majority of local farmers own small plots but they are efficient in production compared to large farmers. Capital is not available neither from local savings nor from formal credit institutions.

The study calls for the adoption of empowerment approach as an alternative approach for effective development in Nuba Mountains and recommends: provision of basic services and infrastructure, development of small scale agro-industries in rural areas, pro-poor market development with dispersed formal credit branches at village levels, and improve good governance at national and local levels. The study, also, proposes some future studies, which complete the holistic approach to solve the problem of the study.

مستخلص الدراسة

بالنظر إلي الإمكانات الكبيرة خاصة الزراعية فان جبال النوبة تبدو مكانا يمكن إن تتحقق فيه رفاهية الشعب بسهولة ، غير إن الأغلبية من السكان و بخاصة الفلاحين يعانون ضنكا في الحياة .تهدف هذه الدراسة إلي إيجاد إجابات لأسباب المعاناة الاقتصادية التي تواجه المزارعين بجبال النوبة توطئة لتقديم مدخل التمكين كمدخل بديل للتنمية صديق للسكان و خاصة المحليين.تري الدارسة إن سياسات التدخل الزراعي الحكومي مسئولة عن المعاناة الاقتصادية بإقليم جبال النوبة. من الفروض الرئيسة للدراسة هو عدم ملائمة سياسات التدخل الزراعي الحكومي في تمكين المزارعين المحليين و تتمثل مظاهر الفشل في تدهور وضعف الخدمات العامة، سوء استغلال و توزيع موارد المنطقة ، ضعف الإنتاج و الإنتاجية.

المنهج المتبع في هذه الدراسة هو المنهج التحليلي الوصفي للظاهرة باستخدام البيانات الأولية التي تم جمعها بواسطة الاستبيان كأداة رئيسة لجمع البيانات . مع ذلك تم استخدام المصادر الثانوية لجمع بعض البيانات المهمة لإغراض الدراسة. لقد استخدمت الدراسة طريقة الحزم الإحصائية للعلوم الاجتماعية في معالجة و تحليل البيانات.

من أهم نتائج الدراسة هي:فشل سياسات التدخل الزراعي في تمكين المزارعين وخاصة صغار المزارعين . كذلك المزارعين المحليين فقراء ذلك لأنهم لا يقومون باستثمارات زراعية. إضافة إلي ذلك إن موارد المنطقة تعرضت إلي سؤ التوزيع في إطار سياسات التدخل الزراعي.

تري الدراسة ضرورة تبني المسئولين بالإقليم مدخل التمكين كمدخل تنموي يركز علي تحقيق مصالح أهل المنطقة خاصة الفقراء منهم و ذلك بتمكينهم علي امتلاك حزمة من الأصول و القدرات تمكنهم من صد الصدمات الاقتصادية الطارئة و تعزيز قدراتهم الإنتاجية. من ابرز التوصيات تقديم و توفير الخدمات العامة و البنيات التحتية بالمنطقة. إجراء إصلاحات في ملكية و استخدام الأرض و إدخال صناعات تحويلية مرتبطة بالزراعة .تطوير الحكومات المحلية و القومية لتعمل بفاعلية لتقديم و تسهيل الخدمات للمواطنين.نشر فروع للمؤسسات التمويلية لمستوي القرى الكبيرة لتكون بالقرب من صغار المزارعين.و توصي الدراسة ببعض الدراسات المستقبلية التي يمكن أن تشكل إطارا كليا لحل مشكلة الدراسة.

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Units of measurement

Fadden = 1.03 acres = 0.420 hectares

Ardeb Dura = 2 sacks = 15 kelas = 138 kg

Ardeb Sesame = 2 sacks = 15 kelas = 147.45 kg

CHAPTER ONE

BASICS OF THE STUDY

1.1 Introduction:

In some official documents, for example label of Agreement of the Nuba Mountains in 2002, Nuba mountains region introduced as a resourceful area with abundant agricultural potentials and some valuable minerals (Takola, 2003, p2) .

In fact, most of the land in the Nuba Mountains is vast, arable, and significantly fertile with average rainfall which can grow, even in bad rainy seasons, ample food crops.

Contrasting to the fact that the area is rich in agricultural potentials, live of the inhabitants, in particular live of small farmers who constitute the majority, is uncomfortable as I noted. Uncomfortable because, their life faces economic difficulties manifested in different aspects of life such as lack of access to public services like; education, health, drinking water, transportation,….etc. In fact, public services in the Nuba Mountains are insufficient and unevenly distributed between the disperse(Al fred, 2005, p62) rural areas. spread of households food insecurity, low levels of productivity, and long lasting civil war which threatened economic activities and caused in mass destruction of infrastructure.

The story of abundant agricultural resource and the economic difficulty facing small local farmers who constitute majority of population, is astonishing to me. Why food producers are food insecure in an area of abundant agricultural resources ? For an ordinary thinking, an area rich in resources must lead to empowered population having comfortable life, and not to the reverse. So, what is going wrong and why in the Nuba Mountains?

To answer the above questions and other related questions, I decided to

carry out this study. The study accuses agricultural development policies making local farmers alien from their resources. This accusation, comes from being the new comer in the livelihood of the people which depend solely on agriculture.

The yardstick used by the study to assess development agricultural policies, is an alternative approach of development known as empowerment approach. An approach which is opposes to the main stream model of development and pro- local people.

1.2 The Problem of the Study:

The notion which led the government to intervene in the agriculture of the Nuba Mountains, was the development of the backward societies of the area, through utilizing the abundant agricultural resources they own. Accordingly, the government have launched series of development agricultural policies that could realize the goal. So, the ultimate objective of these policies, is development of local people.

Unfortunately, the result of the government intervention in the agriculture of the area, is very depressing, putting in mind economic difficulties facing local farmers referred to previously. In fact, life of the local farmers is deteriorated more than ever before, and not transformed into better life as is wanted.

To this study, development agricultural policies applied in the area were unsuccessful to achieve the hoped objectives . On the contrary, these policies are disempowering local farmers instead of empowering them. Accordingly, the problem of the Study, on one hand, is thorough assessment and revision of development agricultural policies on the context of empowerment approach. To see, whether they have led to the empowerment of local farmers or not. Beside, the study will determine the impacts of these policies on the small local farmers. On the other hand, the study tries to introduce new approach of

development which is people –centered approach known as empowerment approach. The study will show what is empowerment approach; the origin, the element, and the advantages of empowerment approach and why is it suitable for development in the Nuba Mountains.

1.3 The importance of the Study:

The importance of the research comes from treating the following issues:

1. Attempts to reach sustainable peace in the Nuba Mountains through applying pro-local people approach to development.
2. Determination of the causes behind the low productivity which characterizes the process of production in the area will help in formulating adequate intervention policies pro-all concerned parties.
3. Provision of statistics for different poverty groups in the area and their economic characteristics which will help policy makers, planning officials, and further in depth-studies in the Nuba Mountains,
4. Introduction of alternative approach to development known as the empowerment approach.
5. Helps in formulating adequate agricultural intervention policies.
6. Criticism and analysis to the experience of agricultural intervention policies as a period affecting profoundly the lives people.

1.4 The Objective of the Study:

The research aims at meeting the following objectives:

1. Determines whether development agricultural policies have led to the empowerment of smallholder peasants of Nuba Mountains or not.
2. Ensure that poverty elimination is more than raising wages and

incomes. It is a process that requires community and individual empowerment.

3. Illustrate that fair and proper resource allocation will lead to sustainable peace in the area.
4. Throw lights on resource base conflicts between cattle breeders and farmers.
5. Recognize the crucial role that agriculture can play in economic development at local and national levels if adequate agricultural policies are adopted.
6. Provide data for further studies in the future.
7. Ensure the productive potentials of smallholder farmers whenever they are empowered.

1.5 The Hypotheses of the Study:

The study hypotheses are as follow:

1. Development Agricultural policies are inadequate to empower small farmers and their households.
2. Local farmers in the Nuba Mountains remain poor because they cannot utilize, efficiently, the resources they own.
3. Resources of the region are miss-allocated by Development agricultural policies.

1.5.1 The study Questions:

The study raised several questions as follows:

a) How development agricultural policies affected the following elements in the area:

1. Family and communal labor as being pillars of production in the traditional mode of production in the region.
2. Factor markets and production relations.
3. Investment and the process of capital formation in the region.
4. Migration.
5. Access of public facilities.

6. Incomes and standards of living.
7. To what extent development agricultural policies ensured inclusion of local people in development projects? Are they actually participate in matters concerning their lives including participation in setting agriculture policies or others are doing it for them?

b) Does development agricultural policies of an exploiter nature? And whether the whole intention of intervention aimed at siphoning small farmers' efforts for the benefit of others?

c) To what extent the civil war in the region is a consequence of the unfair demarcation of communities land to others without proper handle to the grievances of the local people who felt, deprived from their homeland.

d) Is the empowerment approach prerequisite for sustainable economic development in the Nuba Mountains?

e) Does low productivity of small farmers indicate productive capacity of these farmers is eroded? And what is needed to raise productivity of small farmers? Does empowering small farmers lead to the expansion of their production? What is the essence of empowerment approach compared to the previous models of development in the area.

The above questions, are the main questions of the research. More detailed questions are included in the two questionnaires of the research. So, collecting data around these questions will help in assessing and analyzing the socio-economic changes which occurred due to application of agricultural intervention policies. Indeed, this will help in formulating appropriate policies for effective development that is pro-poor of the masses of the region.

1.6 The Methodology of the Study:

To assess the development agricultural policies in the Nuba Mountains

the study followed; analytical, historical, and descriptive methodology. Study population is local farmers of the Nuba Mountains, particularly, smallholder farmers, who are disperse across the remote rural areas. Accordingly, sample of the study is selected from population study using statistical formula as is shown in chapter four. So, primary data is basic in the study, beside, secondary source of data such as references, internet, documents, magazines……etc.

, questionnaire is the main tool of data collection. For this purpose two questionnaires are designed to collect the necessary data. One questionnaire deals with quantitative data. While, the other deals with qualitative data. Although the two questionnaires are targeting the same sample of the study, each is separately processed, discussed, and analyzed, using different tools of data analysis.

1.6.1 Study Limitations:

The study came across some limitations as follows:

1. Some areas in the region of the Nuba Mountains, including the study area, are still under control of SPLA/M. These areas, are known as "liberated areas ",and passing through or conducting whatever work, requires asking an entry pass from the local authorities, free movement is not normally allowed for security reasons. Accordingly, collecting data in these areas without permission will remain risky task and suspicious. Any one, who commits such a work without permission will face a lot of difficulties including jail. Even, asking for the pass is not an easy routine work. Your ask for the pass can be refused without discuss. Unless, you find the officer who understands and appreciates your work, your demand for the entry pass will remain without value. The researcher, was lucky to find one of his school mate who is become officer in chief in the area controlled by

SPLA. Through this personal relation, the researcher was able to get the necessary pass to get through and collect the data.

2. Information system in the whole region of the Nuba Mountains is weak and unorganized. Authorities seems not to recognize the importance of keeping accurate and reliable data. Available data is incomplete and not updated. Sometimes, some authorities refuse to cooperate for what they consider to be security matters and security arrangements. So, they refuse to disclose the information they posses or reluctant to cooperate. This of course, makes the study more difficult and costive.
3. Similar studies are not available in the region, and this also makes the study more difficult to be carried out due to lack of prepared data.
4. Transportation and communication facilities in the region are not accessible. Most parts of the region, particularly the rural parts, are not well connected to each other with accessible roads and streets. Therefore, the study consumed more time and more cost.

1.7 Organization of the Study:

This research is organized into four chapters. Chapter one, is devoted to introduction and research plan. Chapter two discusses and explains the theoretical and the conceptual framework of the study.

Chapter three, is devoted to background information about the Sudan and the Nuba Mountains. It details information about the economy and agriculture of the Sudan. While, detailed background information about the Nuba Mountains such as; location, geography, and the physical and social characteristics of the Nuba Mountains, history and settlement of the inhabitants, Nuba cultivation, land tenure, and forms of Nuba labor organization are offered.

Chapter four, divided into three parts and devoted to sample and data analysis. Part one deals with processing, analyzing, discussing, and

findings of the quantitative data. Part two deals with processing, analyzing, discussing, and findings of the qualitative data. Part three deals with testing hypotheses, conclusions, recommendations, and proposed future studies.

CHAPTER TWO

THEORETICAL AND CONCEPTUAL FRAMEWORK

2.1 Introduction:

Since intervention of the government in the agriculture of the of the Nuba Mountains, under the notion of development within the context of the main stream economic models, a lot of changes have taken place. Some of these are still taking place although decades have passed. They are profoundly affecting the entire live of the people. Unfortunately, the bulk of these changes are negative. For instance, nutritional status in the area is adversely affected by some agricultural projects. An overemphasis on cash crop can contribute to the general neglect or some earned income many not be spent on food for the family(Casley/Kumar, 1987, p138). All this, indicates that, the mainstream economic development model adopted in the Nuba Mountains was not successful because life of people, particularly, local farmers in the remote rural areas has not transformed into better life.

So, study of the changes that happened due application of development

of agricultural policies, and determine, clearly, defining what is meant by development, in the particular case of the Nuba Mountains, is needed. Without knowing this, authorities concerned with introduction of development can replicate the old experience of development which failed to succeed in the Nuba Mountains. So, development as a concept must not let as loose term. It must mean something tangible. Something with tangible benefits that can be measured in the lives of people.

In fact, development as a concept is still ambiguous to many people. Therefore, more elaboration of the concept of development is discussed in this chapter. In addition, some development theories and approaches such as empowerment, capacity building, and sustainable development are, also, discussed to give good understanding and knowledge to available alternative approaches to development and then choose the suitable one for the area. Without this theoretical understanding of development, any trial to set development in the area will be working in a vacuum and will reach nowhere. So, the rest of this chapter runs as follows:

2.2 Main stream economic development models:

The term development, as a concept is one of the most exhausted terms in the recent history of mankind. Extremely exhausted word from overuse. Almost every hour passing a seminar, summit, dialogue, or agreement on development matters is taking place somewhere around the world. The term development is one of the terms mostly used across the global. Yet, the term development as a concept is still ambiguous, dubious and elusive to many people (Linda, 2007, p6) i.e. what is meant by development is not well established in the minds of many people. In addition, the term development can mean different things to different people basing on the definite area and definite period. For instance, development that takes place, now in North America is not the same development people that advocate for in the Nuba Mountains. Indeed,

there are differences in the quality and the scale of things that should be generated by development in the different areas. Whether development should provide basic needs or ensure human rights. This will depend on the scale of resource allocation, priorities of people, and the degree of distribution of these resources among the people. Therefore, development seems as distinct types. However, there exists a common ground between these distinct types of development.

The common ground is that development, elsewhere, in the world concerns with making human life more humane and more adequate (Todaro, Smith, 2003, p7).This necessitate addressing and removing problems and difficulties that make human life more difficult, such as poverty, unemployment, and inequality of income distribution. To reach this understanding, social and economic theorists have come across many stations of thinking throughout history.

Beginning with the writings of the great thinkers of the past, particularly, the classical economists; Adam Smith, David Ricardo, Thomas Robert Mathis, John Stuart Mill, and Karl Marx, who stand as prominent thinkers of the late eighteenth, and early nineteenth centuries, we find that these thinkers were solely interested in exploring the nature and the causes of economic growth i.e. they were looking for conditions that could generate and sustain annual increase of GDP (Sachs, 2005, p33) Accordingly, economic growth is a per capita increase in GDP which is referred to the market value of all goods and services produced by an economy during certain period. It is conventionally, calculated or measured as the percent rate of increase in real gross domestic product(GDP).

Then, the real GDP per capita of an economy is often used as an indicator to average standard of living of individuals in that country, and the economic growth is often seen as indicating the increase in the average standard of living.

Indeed, the interest of the classical and the neoclassical economists, who advocated economic growth, was not, to answer the question of who will get how much of the produce? But they were interested in the enhancement of production as target objective of the whole economy. Perhaps, they assumed that economic growth as soon as is realizes it will , naturally and automatically, lead to enhance living standards of the people, particularly, the poor one and make the necessary well-being of people.

However, there are some problems in using growth in GDP per capita to measure general well- being of the people (http// www. investopedia.com) as follows:

1. GDP per capita does not provide important information relevant to the distribution of income in the country.
2. GDP per capita does not take into account negative externalities from pollution consequent to economic growth.
3. GDP per capita does not take into account positive externalities that may result from services such as education and health.
4. GDP per capita excludes the value of all activities that take place outside of the market place.

Coming to the end of World War two, development, for the first time, has become an important field of study, attracting several scholars (Todaro, Smith,2003, p1). Therefore, development as a field of study is a recent field compared to other disciplines of economics. Only in the eve of the end of world war two, people have started to think, seriously, about poorer nations of the world. And what has to be done for them? This led to establishment of national and international institutions to promote economic development of the world countries. Accordingly giant institutions, such as World Bank and its affiliates, United Nations agencies, and non- governmental organizations (NGOs), are established to promote economic development across nations (Thirlwall, 1979, p14).

These institutions stand today as witness of the worldwide involvement in the question of economic development as a separate field within the economic discipline. A field that is thoroughly opposes the notion of economic growth and it's measurements.

2.3 The Nature of Economic Development:

Economic development is a distinct field within economic discipline. It goes beyond both traditional economy and political economy. While, traditional economy focuses on and specializes in, the efficient, least-cost allocation of scarce productive resources, looking forward, to produce optimal growth over time, with view of economy as is characterized by consumer sovereignty, automatic price adjustments, decisions made on the basis of private profit and utility maximizing calculations. While, political economy, on other hand, goes further than traditional economy. It is concerned with social and institutional arrangements through which certain groups of political and economic elites influence the allocation of scarce productive resources now and in the future i.e. political economy is always concerned with finding out the relationship between politics and economics, putting, special emphasis on the role of power in economic decision making process.

consequently, the field of economic development stands in the distance beyond both traditional economy and political economy. Economic development is concerned with efficient allocation of the scarce productive resources to generate sustainable economic growth over time. Further, economic development deals with economic, social, political, and institutional mechanisms in both public and private sectors, to recognize rapid and large-scale improvement in level of livings for the poor masses in the third world (Todaro , Smith, 2003, p9).

According to the above, economic development differs from economic growth in that, the ultimate goal of economic development is to increase the living standards of the people through sustainable economic growth

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Still economic growth in some countries of the third world, focus on economic calculations as economic objectives rather than social and political objectives as priorities, as in the rest countries of the world.

Focusing on economic calculations, economic growth model is missing some crucial elements, while economic development model, looks more comprehensive compared to economic growth model. Economic development model encompasses, economic, social, and political elements that could generate wide scope transformation to the poor masses of the people.

It is assumed that benefits of economic growth can ''trickledown'' to the poor masses in the forms of jobs and other services. But, economic development as a model always focuses on exploring mechanisms that keep families and the entire nations, out of poverty trap. Therefore, economic development is viewed as something evolved from production-focus process to people - centered process, and is shortly referred to as just "development" (FriedMann,1998, p1).

Today , every nation strives for development. It is a common ground in all economic plans across the world nations. But, it is not that simple process to be achieved. It is complex and difficult to achieve. It is so because it is a total make up of huge number of inter-related factors. It is a group of multiple and interrelated arrangements which lead to one thing called development. Consequently, development is not purely economic phenomenon as is always being thought by traditional and neo-classical economists. It encompasses as well non- economic phenomenon that include; attitudes towards life, work, power, human rights, democracy, and administrative structures, cultural traditions, system of land tenure, degree of participation of people in government decisions making, and other government activities (FriedMann, 1992,

p31). So, in order to realize economic development or shortly " development" in any country of the world, a set of multi-dimensional problems must be addressed, including the non-economic problems.

Sometimes people forget to consider non-economic phenomenon in their development strategies. For instance, in the case of the Nuba Mountains the non-economic phenomenon was forgotten when government intervened to utilize, economically, the land of communities through individual big farmers schemes. The focus was maximization of economic profits without handling the negative effects of this process on local small farmers who historically own this land (Abdelgabar, 1997, p28). in fact this process have squeezed resources of the Nuba Mountains for the benefit of minor group of traders of outsiders, at the time impoverished local small farmers who constitute the majority. Usually failures in development efforts, in many developing countries, are attributed to exclusion of non-economic factors in the analysis of economic development (Todaro, Smith, 2003, p15).

Traditional economics assume, as is said before, that development is purely economic phenomenon where the mere interest of the national economy is to generate and sustain, annual increase of GNP at a rate of 5% to 7% or more. Also economic development to traditional economists, is planned arrangements to decrease the shares of agriculture in GNP and increase that of the industry sustainably (Todaro, Smith, 2003). Basing on this thinking, development strategies were formulated to encourage rapid industrialization as a leading sector of the entire economy. Often, these strategies are performed at the expenses of agricultural sector where the majority of population live, particularly, the poor farmers. This simply means that agriculture and the farmers' are not priorities in these development strategies. Furthermore, these strategies have assigned role supportive to agricultural sector. It was determined that agriculture should give support to developing industry

through following:

1. Agricultural crops shall be cheap in prices to make industry gain more benefits when using these crops as raw materials.
2. Agriculture has to provide people working in the industry with low price food.
3. Agriculture shall provide industrial sector with capital from the sales of its products.
4. Agriculture must redirect the surplus labor to other sectors including industrial sector.

In summary, economic growth as purely economic phenomenon has been dominating world economies for a long time. Industry, was thought to lead the economy by the support of agriculture . The assumption was that, the rapid gains of economic growth generated from the industry by the support of agriculture, would trickle -down to the poor masses in the form of jobs and other services, which create conditions necessary to accommodate better human life for the whole society (Sachs, 2005, p80).Unfortunately, levels of living conditions for the poor masses, in the third world in particular, remained unchanged, though many developing countries have succeeded to register increased records in economic growth. In some parts, for instance, in Africa, living standards have worsened even more than ever before.

The assumption that fruits of economic growth model will trickle down, automatically, from the focal points to the peripheries , was futile assumption.

Unless, the expected fruits of economic growth are carefully planned and distributed properly, they cannot reach the target people. If the target people are big farmers then the benefits will go to them and nobody else. In situation like this the rich will get richer and the poor get poorer. If non-economic factors are considered as well as economic factors, then economic returns are more probable to spread over to the

rich and the poor as well.

So, economic growth must be accompanied by other arrangements of non-economic factors. Economic growth cannot sensibly be treated as an end itself. Therefore, development is more concerned with enhancing our lives and freedom we enjoy (Sen, 1992, p22)

There are allegations in the area of the Nuba Mountains, that economic growth in the area has not covered everyone in the area. Only the 'Jalapa' have benefited from this process. The majority, who are mostly local farmers, are excluded from getting the benefits of economic growth. The local farmers, who supposed to be the beneficiary groups of development efforts, were neglected and excluded from getting the benefits of development. Moreover, the resources of the area are redirected towards others, who are already economically better off .

In fact, the above allegations are widely believed in the area. But, they need careful study to prove whether they are true or false. This study, will throw lights on how some of the inhabitants have benefited and some lost, from agricultural intervention policies. However, some approaches to people-centered development such as sustainable development, capacity building, and empowerment are also treated by the study to create better understanding of development alternatives as follows :

2.4 The sustainable development approach:

As is said before, sustainable development is a concept which recently evolved in development literature. It has been found due to the criticism of the main stream economic growth models for concentrating only on economic growth and ignoring environmental aspects. The concept first appeared in the world conservation strategy in1980s and defined as "development which meets the needs of the present without compromising the ability of future generations to meet their own needs

(Abdelgabar, 1997, p43) .

Michael Pretes in 1991, in his book" Dependency, Development and Environmental Control writes, " sustainable development is a loose theoretical framework that recognizes the importance of economy-environment integration", and he confirmed that sustainable development, as a concept, has a lot of definitions but share the following characteristics:

1. Emphasis on compatibility between economic activity and environment.
2. Emphasis on compatibility between economic activity and indigenous social groups.
3. Move away from use of non–renewable resources to renewable ones.
4. Shift to greater local control over resources and use. This includes greater decentralization and more local decision –making. Environmental control will become local.
5. Move to a more equitable distribution of wealth and resources.
6. Multi sectored approach to economic change, including diversification of the economy and avoidance of dependence on any one commodity.
7. Emphasis on economic activity rather than on economic growth i.e. Who get what and how much is not in the interest of economic growth. It is interest, is maximization of production which lead, sometimes, to environmental damages. Therefore, the emphasis should be on economic activity which takes into consideration environmental conservation.

Also, sustainable development is defined as something precondition for growth to sustain annually. It means, economic system must be capable to generate enough surpluses which can be reinvested for more and sustainable economic growth(Abdelgabar, 1997, p44) .

Actually, sustainable development is a broad term. It's a multi dimensional system process. It is, economic, environmental and the socio/cultural systems. The economic system of sustainability is based on generating income over time while maintaining the natural resources that produce this income. The environmental system of sustainability focuses on the stability and the balance of the whole ecosystem. The socio-cultural aspect of sustainability seeks to maintain stability of social and cultural systems, including reduction of destructive conflicts.

The social dimension of sustainable development is becoming increasingly important. David Pearce in 1995 in his book, Sustainable Development and the Political and Institutional Challenge, wrote "from a political prospective, one of the most important of the fundamental principles of sustainable is fairness. It applies to rights of all present generations to enjoy fundamental democratic rights and access to sustainable livelihood. While, the social/cultural dimension states simply, but powerfully, that a sustained society is also a truly democratic society with rights of expression, dissent, participation, self reliance, and equity of opportunity."

In agriculture, sustainability is concerned with negative social and environmental effects of pursuing yield maximization. The central issue, in sustainable agriculture, is not maximization of yield but its long term stabilization. So, sustainable agriculture does not mean to abstain from cultivation , but it means controlling human behavior from misusing natural resources in the way that it threaten the access of future generations to these natural resources, particularly, some of these natural resources are renewable and others are non-renewable. The matter is, how to intensify agriculture while balancing the demands on the natural resource base and avoiding adverse environmental consequences (Casley/ Kumar, 1987, p150). Accordingly, sustainable development approach appears to hold promise for the analysis of

agriculture development. It seems to be suitable for the analysis and discussion for the problem of the Nuba Mountains i.e. the problem of disempowerment of the peasants and the non- sustainability of development. Questions, such as whether development projects in the Nuba Mountains were of sustainable nature? In this concern, some indicators like land clearance, land allotment, agric/ credit, productivity, and production costs will be examined. Also, questions like what are the impacts of these development projects on the Nuba peasants? In this type of questions other set of indicators are adopted. These include access to land, local forms of labor organization, and change in the mode of cultivation. The intention here is to explore the socio-cultural dimension of the development efforts in the Nuba Mountains.

So, sustainable development approach gives and presents good analysis to the situation concerning people's live ,particularly, the lives of the poor peasants. Also sustainable development challenges efforts of development in the area as being successful or not.

2.5 Empowerment Approach to Development

2.5.1 The Origins of Empowerment approach:

In fact, the origins of empowerment approach to development are deep rooted in the ideas of the alternative development approach which thought to replace the mainstream model of development for its failure to address critical issues of development, as is said earlier in the previous lines (Friedmann, 1998, p3). Moreover, alternative development is hoped to lead the world economy to a direct improvement in the conditions of the poor, especially the rural poor, and at the same time be compatible with emerging environmental concerns. Dudley Seers, one of the pioneers in the field of alternative

development, started to criticize conventional development doctrine as being an elusive concept and thus called for rethinking of development doctrine .In 1969, Dudley Seers continued criticism to the experience of the mainstream model of development as being unable to overcome central issues of development, such as poverty, inequality, and unemployment. He put his argument as:

"In a country executing economic plans. What has been happening to poverty?, what has been happening to unemployment?, and what has been happening to inequality? determine whether this country in steps of development or not. If one or two of these central issues of development have been growing worse, especially if all three have, it would be strange to call the result development even if per capita income doubled".

These statements have become the major causes which paved the way for the development thinkers to call for redefinition of the concept development and the development strategies and the plans derived from the old definition of development. Accordingly, alternative development was established as a new approach of development that is effective in the lives of people, particularly, the lives of poor people.

Alternative development embodied empowerment approach as fundamental element that fuels development effectiveness (FrirdMann, 1992, p31). So, empowerment and alternative development are two faces of one coin. Both influenced each other and reciprocal in effect. However, sometimes the term empowerment is confused with the term capacity building and use them as synonyms. While capacity building focuses on skills development of people, empowerment as an approach advocates for the expansion of both assets and capabilities to the poor people(Eade, 1997, p7).

In the coming lines more lights will be thrown to define and determine

the concept of empowerment as distinct concept.

2.5.2 Definition of Empowerment approach:

Literally, to empower, according to the Cambridge international dictionary of English, means to give someone the official or legal authority or the freedom to do something. For example, empowering the poorest people in the society, in relation with power sharing and votes, is to make sure they vote freely.

Linguistically, empowerment is a process which enables one to gain power, authority, and influence over others, institutions, or society.

While, due to the dictionary of Wikipedia in Google website, empowerment refers to the totality of the following or similar capacities:

1. Having decision-making power of one's own.
2. Having access to information and resources for better decision.
3. Having a range of options from which you can make choices.
4. Ability to exercise assertiveness in collective decision making.
5. 5-Having positive the ability to make change.
6. Ability to learn skills for improving one's personal or group power.
7. Ability to change other's perceptions by democratic means.
8. Involving in the growth process and changes that is never ending and self initiated.
9. Increasing one's positive self- image over coming stigma.
10. Increasing one's ability in discreet thinking to sort out right or wrong.

In short, empowerment is the process that allows one to gain knowledge, skill-sets and attitude needed to cope up with the changing world and the circumstance in which one lives (Friedmann, 1998, p15).

2.5.3 World Bank's vision to empowerment approach:

Based on the World Development Report 2000/3001, the World Bank formulated a work plan as a strategy for poverty reduction in the world.

Two priority areas of the Bank's support to the countries concerned were identified as follows:

a. Building conducive climate for investment, jobs, and economic growth.
b. Empowering poor people and investing in their needs.

So, empowerment stands as corner stone in the strategy of the World Bank to combat poverty. In fact, empowerment as a term has different meanings in different socio/cultural and political contexts.

Broadly speaking, to the World Bank authorities empowerment is a process that concerns with the expansion of freedom of choice and action (Narayan, 2002,p11). This means increasing one's authority to gain control over his resources and take decision that will affect his own life. So, whenever people exercise freely real choice, they gain increased control over their resources and their lives and this will lead to enhance their wellbeing.

The problem of the poor people, like that of the Nuba Mountains, is that their choices are extremely limited because they lack assets and power that could let them and help them negotiate, with more powerful people, for fair deals for themselves. Therefore, World Bank authorities see or define empowerment as the following:

" Empowerment is the expansion of assets and capabilities of poor people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives"(Narayan, 2002,p14)

Accordingly, poor people need a range of assets, both physical and financial, as well as capabilities. Assets including land, housing, livestock, savings, etc, that enable people to withstand shocks and expand their choices, without which poor people will suffer from unfair deals when they exchange what they possess with that of the powerful people in crops markets for example.

Actually, the extreme limitation of poor people's assets severely constrains their capacity to negotiate fair agreements for themselves, especially, when they sell their labor or their crops in the market. Failing to do fair deals in the markets always increases their vulnerability and makes their lives continue without positive changes.

Capabilities on the other hand, inherent in people, enable people to use their assets in a good manner to increase their wellbeing. These capabilities include the following:

-Human capabilities such as good health, education, production or other life- enhancing skills.

-Social capabilities like social belonging, leadership, relation of trust, sense of identity, values that give meaning to life and the capacity to organize.

-Political capability, like the capacity to represent oneself or other, access to information, form association and participate in the political life of community or a country.

Since poverty is a multidimensional problem, poor people will require a range of assets and capabilities at individual level (such as health, education, and housing) and at the collective level (such as the ability to organize and mobilize to take collective action to solve their problems .

Furthermore, empowering poor people of the Nuba Mountains, both men and women, requires the elimination of all barriers of both formal and informal institutions. Because these barriers prevent the poor peasants from taking necessary action to improve their wellbeing. By institutional barriers we mean laws, rules, and regulations upheld by states, markets, civil society, and norms of social solidarity, corruption, and social exclusion.

2.5.4 Elements of Empowerment approach:

Actually, successful efforts to empowerment requires four closely intertwined elements and represent the area of state reform as follows (Narayan, 2002, p31):

a) Access to information:

Information represents the power. Whoever have or possess information is the most powerful one. Informed people are better equipped to take advantage of opportunity, access services, exercise their rights and hold state and no state authorities accountable before the people.

The critical areas where information is most important include performance of the state, financial services, markets, and rules and rights regarding basic services. Also, for the government to ensure responsiveness to the people's priorities, government must collect information about these priorities.

So, two way information flows from governments to people and from people to governments are necessary for responsive people and responsive and accountable governments. Sometimes development projects are like isolated island to the target people. No body from the target group, knows, for instance, the budget or the magnitude of the performance in the project. Therefore, nobody could say something because he either doesn't know or he has no right to ask. This of course, will not lead to the correction of the mistakes accompanying project implementation; therefore two/way information flow is needed for better performance of project which will lead to better live.

b) Inclusion/ Participation:

In the old development model, poor producers are complaining to be alienated from their own resources, not only that, but these resources are redirected through policies to better-of outsiders. While, an

empowering approach to development treats poor people as co-producers, with authority and control over resources decisions concerning their use. So, inclusion of poor people in the process of decision making ensures that limited public resources are utilized on the knowledge of the community people and according to their priorities. This, in turn increases and brings about commitment of the local people to change process.

c) Accountability:

Laws, regulations, and ethics of the State or government must be modified in the way that makes State officials, public employees, politicians, answerable for their policies, and actions that affect the wellbeing of the citizens. So, accountability refers to the ability or the access of the poor people to call people of authority to account and make them answerable for their behaviors which affect public interest.

Three types of accountability mechanism are exist: political accountability of political parties and representatives through democratic elections, administrative accountability of government institutions, and finally social or public accountability mechanism which hold state institutions accountable before the citizens (Narayan, 2002, p151).

d) Local Organizational Capacity:

Local organizational capacity refers to the ability of people to work together, organize them, and mobilize resources to solve problems of common interest. When, poor people come together and organize their efforts, they become stronger and their voice, also, become more louder to be heard by the employers and then meet the demands of the poor.

So, organized communities are more likely to have their voices heard and as their demands met than communities less organized. A soon as

communities are organized they are more capable to influence government decision making and gain collective bargaining power with suppliers of raw materials, buyers, employers, and financial authorities. This is how development could become effective in the life of the people.

The above mentioned four elements of empowerment are combined together and create more responsive, effective, accountable, and inclusive institutions. Such institutions enable poor people to develop their own capabilities, increase their assets, and move out of poverty. Therefore, empowerment approach as precondition to development in the Nuba Mountains will ensure effectiveness of development and give meaningful impact on the lives of people.

2.6 Previous Studies in the Area:

Generally speaking, Nuba Mountains, in terms of studies, is still virgin and poor. Closely related studies to the topic of this study are not abundant. However, there is a recent trend to conduct studies on the different issues in the area. This trend is ensured by the establishment of Dalanj University to undertake researches in the area as part of its main objectives of the university.

Concerning this study, three studies are found to have some linkages to the topic of the study. The first study was conducted in 1990s by Abdelgabar for PhD award with study title "Mechanized Farming and Nuba Mountains Peasants" for. The second, was in 2003, carried out by Takola with study title" Peasant Households Food Insecurity" for the award of MSc degree. The third study was in 1984 by Khalid Affan with study title " Towards an appraisal of tractorization experience in the rain lands of Sudan". The first two studies, have criticized government interventions as having negative impacts on the small local farmers. They highlighted the adverse side of the agricultural policies on the

people and explained the causes behind the live difficulty. The third study appraised the experience of tractorized farming, as social mode operation existing side by side with family farming mode of production and the problematic aspects it can create. These studies, have treated the problems of agricultural production and other associated problems in the area, but each from different perspectives. Bellow is summary of these studies:

a) Mechanized Farming and Nuba Peasants.

In 1990 Omar Abdelgabar had conducted a research for the award of PhD titled "Mechanized Farming and Nuba Peasants" in the study area, mainly, in Habila area. The objective was to examine the sustainability of the Mechanized Rain fed Schemes as form of agriculture and model of development. The study addressed a lot of questions raised by the study. Below are some main questions(Abdelgabar, 1990, p6):

1. What kind of agricultural policies adopted within the project?
2. How land is allotted to scheme holders and credit is managed?
3. Who are the holders of the mechanized schemes?
4. The impact of the mechanized farming on:
   - The means of access to land.
   - The local form of labor organization.
   - The strategies and methods of cultivation.
   - The process of labor and land differential.

The study employed questionnaire, interviews, group discussion, observation, and archive works as methods of data collection. Of the most prominent findings of the research are:

- Vast area amounting 350000 feddans is demarcated and cleared off the trees at nominal cost.
- Despite the name, mechanized schemes remained labor intensive.

- The majority of the scheme holders are Jalapa traders who are mainly from the North of the Sudan and usually stay outside the scheme area.
- Jalapa traders undertake mechanized farming just to accumulate further capital. For that purpose, Jalapa don't mind to use non-standard methods of cultivation, sometimes they cultivate and continue cultivating, although production is deteriorating , because need financial resources which they directed to trading.
- Nuba land has being expropriated in favor of the Jalapa through using Land Act of 1970 as clear process of changing means of access to land in the area.
- Nuba labor which previously organized on a family and communal basis for subsistence have changed into wage labor, beside, new ways to measure labor, namely, efficiency and profitability are introduced, instead of values of solidarity and cooperation.
- Traditional mode of production did not disappear, but maintained to supply mechanized farming schemes with cheap labor.
- Mechanized rain fed farming is unsustainable type of agriculture because it causes in ecological degradation by clearing mass area off trees. Beside, mechanized farming tends towards short term yield maximization and transfer of payments outside the production system.
- Mechanized Farming Schemes is not successful model of development because it lacks aspects of compatibility between economic activity and the interests of local inhabitants. It adversely affects local production systems, mainly on land acquiring, labor, and methods of cultivation.
- Mechanized farming lacks also elements of fairness and equity in relation between local people and the Jalapa.

Finally, the study, based on the above findings, recommended the

following:

1. The necessity of reducing farming within the demarcated area so that part of it can be left to recover fertility and the remainder adopt fallow and rotation system.
2. The necessity of maintaining local production system through doing the following:
   - Returning back the demarcated areas around the villages to the peasants.
   - Allotment of Nuba peasant's village cooperative scheme or households' tenancy tenure system.
3. Adoption of more flexible agricultural credit formula so that credit can reach everybody who actually need credit, particularly, the poor.
4. Intervention policies should be inter-disciplinary, ecologically oriented, multi-sectored, and integrative in all mechanized farming schemes.

Accordingly, the Mechanized Farming Schemes was not a type of sustainable development model. Local people have lost their resources through the process of siphoning resources for the benefit of Jalapa traders, and become more weak and vulnerable. Anyhow, mechanized farming schemes are now phased over, but a lot of damage left. On local people's side, they are left disempowered and vulnerable. On environment side, vast area amounting 350000 feddan is left without trees and vegetation. The only group benefited is the Jalapa group, who managed to direct the returns of the schemes, outside the production system, basically towards trade.

b) Peasants Household's Food Insecurity in the Nuba Mountains:

"Peasants household's food insecurity in the Nuba Mountains' is the second study conducted in the study area. It has been done in 2003 in Kurkol administrative unit. It is one of the four administrative units of

Habila locality. The locality known and famous with mechanized farming big schemes. So, the area is farming area and most of the population are small farmers who cultivate small plots outside the demarcated schemes..

The study tackled the problem of food insecurity among smallholder farming households. It is astonishing problem, to see farmers whose main function is food crop production are food insecure(Takola, 2003, p1).

The study raised some questions such as: why smallholder farming households are food insecure? What prevent farmers from producing ample production? Is it because land is infertile in the area? Or because of fluctuations of the rainfalls? What is going wrong?

The most prominent hypothesis of the study, is that the study accuses government agricultural intervention policies to stand behind peasants households food insecurity.

The methodology used in the study is descriptive, using data collected mainly by questionnaire as the main tool of data collection in the study. The data is processed and analyzed using SPSS method.

The major findings of the study, is that the government, through agricultural policies has tied the subsistence agriculture of the Nuba Mountains to the market economy. This process was done without adequate arrangements and the consequences were as follows(Takola, 2003, p48):

1. Involvement of peasants in cotton production to meet cash need.
2. Decline of man hour labor devoted to family farm which used to provide family food.
3. Fragmentation of family labor which remained the unit of production in family farm.
4. Change in local production system.

5. Allocation of large schemes to individual big farmers

All these arrangements led to the failure of local production system to provide ample food. On the other hand, the new system which is connected to the market, failed also to compensate lost food from the market.

Also, it is found that fluctuations of the rainfalls and soil fertility have no significant effect in determining food situation and nutritional status in the area. What really matters, is the development agricultural policies which eroded capacities of the local producers with unsuitable agricultural projects . So, based on the above findings, the study recommended the following:

1. Peasants should have full access to participate in the project cycle and be allowed to spell out their opinions and their needs.
2. Timely supply of inputs.
3. Rethinking of agricultural intervention policies, particularly, those concerned with mechanized farming schemes.
4. Introducing of full modernization program.
5. Reintroduction of modernization program with full mechanization in all agricultural operations.

c) Towards an appraisal of tractorization experience in rain lands of Sudan.

As is said above, the third study is an appraisal of tractorization farming experience or more precisely the experience of mechanized farming, in rain lands of the Sudan, which Nuba Mountains is part of it. It has being conducted in 1984 by Khalid Affan. The focusing point of the study, is that tractorization or simply mechanized farming, as social mode of production is still controversial, and the debate between the proponents and the opponents of tractorization is still on-going. The arguments of proponents rest in that Tractorization (Khalid Affan, 1984, p5):

1. Allows more land use
2. Raises output
3. Increases employment
4. Saves labor

While, the arguments of those opponents to the tractorization process, is that tractorization:

1. Causes productivity to decline through the pass of time
2. Leads to long term damage to environment
3. Creates conflicts with peasants agriculture
4. Undermines principle of social equity by making the richer rich

So, basing on these arguments the study defined some aspects as the most problematic, which used in evaluating the experience of tractorization. And the problematic aspect are as follows:

-Land use and the associated effects on the physical environment

-Land productivity and yield

-Employment generation

-The extent of conflict or mutual support between mechanized farming and peasants agriculture

To carry out the evaluation test of the tractorization experience, the study depended on a number of surveys in specific regions. For instance, Hadari's survey of mechanized farms in Gadaref, eastern Sudan 1968,Simpson's survey of Damazin, central Sudan in 1975/76, O' Brien's survey in 1974/75 of Habila mechanized farming (South Kordofan), and the author's survey of the same area of South Kordofan in 1976. The study reach evidence that tractorization or simply mechanized farming is unsustainable type of agriculture, because it causes environmental damages on the long-run. Nevertheless ,the study needs interdisciplinary

study to evaluate the performance of tractorization (Khalid Affan, 1984, p89)

Finally, it is obvious that these studies talked the problem of agricultural production in the area, but from different perspectives. Both studies based on their analysis on the impact of intervention policies on the local people of the Nuba Mountains in general and agricultural producers in particular. The first study, argues that development agricultural policies siphoned resources of the local people towards "Jalapa" traders whom government policies usually favor. While, the second study sees that intervention policies destructed the local production systems which used to provide ample food for the local farmers and replaced them with market oriented systems. The third study, concentrated on evaluating the experience of tractorization co-existing with family farming mode of production and the pros and cons that can incurred.

This study, is distinct from the other three studies in that, it considers government agricultural policies as responsible for worsening the socio-economic live in the area of the Nuba Mountains. Accordingly, this study differs from the previous studies, in that it follows interdisciplinary approach to tackle the problem of the study. Here the problem is not just an alienation of people from their own resources as it comes in first study or because of the changes in the local production systems as the second study advocates or the tractorization causing ecological degradation on the long-run. The problem in my study is more complicated and of a multi- dimensional aspects. Here, more elements are contributing to the problem of socio-economic difficulty in live of the local people. The problem which stemmed from application of inadequate agricultural policies under the notion of developing backward societies of the Nuba Mountains. So, the problem is economic distortions of people happen in the name of introducing development

facilities.

What people need in the Nuba Mountains is type of development that is pro-poor. The old development model applied in the area was pro-rich and ended in disempowering the capacities of local farmers. Therefore, this study advocates for the adoption of empowerment approach as suitable strategy for the development in the area. It is suitable because it advocate for the expansion of assets and capabilities to poor people. With these two elements small farmers capable to carryout effective farm investments.

CHAPTER THREE

BACK GROUND INFORMATION OF THE STUDY AREA

3.1 Introduction:

The study area is Nuba Mountains which locate at the centre of the Sudan as before the secession. It is divided, administratively, into five districts (localities) ; Dilling, Kadugli, Lagawa, Rashad, and Talodi. Its characterized by huge agricultural potentials and thus suitable for crop and animal husbandry.

This chapter focuses on addressing details of information about issues of study the area and some related information of issues at national level affecting Nuba Mountains like; the economy , agriculture, agricultural policies, and agricultural potentials of the Sudan.

3.2 The Sudan:

3.3 Economy of the Sudan:

The Sudan, one of the Africa's largest countries, is predominantly agricultural economy. Nevertheless, the recent development of oil industry has led to tremendous shifts in the economic structure of the country.

The inherited colonial economic structure, which relied on agriculture, remained unchanged for a long time. It is until the mid 1990s when oil extraction process started to become a reality, although it has been discovered since 1980s and remained unexploited due to rebel activities in the area of oil deposits.

Oil extraction and its exports has stimulated and fuelled the economy of the Sudan to start a number of associated industries and saved some capital for investments. Yet, agriculture remained the most important economic sector because it maintains food and jobs for 80% of the Sudanese people (Abdelgabar, 1998,p26).

When the Sudan started as an independent country in 1955/1956, 86% of the total labor force was engaged in agricultural sector which was

contributing to GDP by 61% at that time. Since the time of independence agricultural contributions to GDP continued to constitute about 50% of the State's GDP till the end of 1960s. Estimates of GDP in the period 1969/ 1970 – 1996 indicates that agriculture has been the backbone of the Sudan's economy in that period. Nevertheless, the bulk of the export production was confined to cotton which constituted, for instance in 1960/1961, 60% of the total exports of the Sudan (Osman, 2002,p27) .

Putting the huge agricultural potential of the Sudan in consideration, the country has ample opportunity to develop the economy relying on agricultural revenues. In fact, since 1956 to 1980s, cotton revenues has been supporting the annual budget of the Sudan. Cotton was the backbone of the Sudan economy for a long period of time. But, these revenues started to decline annually since the beginning of 1980s and then stopped completely in many areas of the Sudan, including Nuba Mountains in 1985(Osman, 2002,p28) .

It was not wise decision for economy of the Sudan to relying on one cash crop. It is risky, of course , if the economy failed to diversify economic activities. Diversified economy secure the economy and enable it to withstand economic shocks. An economy relaying on one cash crop has no advantage whatever the magnitude of its revenues. Prices of the crops may fluctuate and decrease to the minimum or crop production may fail.

In either case, the economy will face difficulties if it depends on one cash crop like the economy of the Sudan which depended on cotton and the Gulf countries, which depend on oil exports. Therefore, the shrink of production due to either reason or sharp decline in international price of the cash crop will affect, negatively, the revenues in hard currencies, which automatically weaken the country's ability to import both capital goods necessary for development and consumable goods for the people.

Agriculture continued to play that vital role in the economy of the Sudan despite that oil discoveries proved huge potentials. For example, in 1991 agricultural raw materials and food items amounted to 98% of the country's export commodity structure (Abdelgabar, 1998, p27).

Fortunately, the acute economic crisis of the country which escalated in 1980s by the great drought effects and the north /south civil war, is now getting less severe ever than before. The economy seems to be getting out of its bottleneck. National economy started to show increase in the revenues. Also, the economy started to pay back debts, and showed decline in inflation rates. Of course, oil exports has increased national revenues, caused inflation rates to dropped sharply to16% in 2004 after peaking up to 166% in 1996(http://www.Theodora.com) .

The GDP real growth rate for 2004 was 5.9%. It was attributed to oil production which has boosted national income since oil exports began in mid 1999. Nevertheless, oil exports are not expected to boost the economy, significantly, unless the civil war which absorbs most of the national budget is stopped elsewhere in the Sudan (Ibid).

In fact and despite of the economic sanctions, civil war, and the drought effects of the mid 1980s, the country has been able to build an autonomous economy succeeded in making remarkable changes in the performance of the Sudan's economy (El- Battahani, 2006, p107). The indicators of this economic performance can read as follows:

1. The GDP has increased, significantly, because the annual growth rate has risen from 2.2% in 1990/89 to 7.2% in2004 with average annual growth rate 6.6%.
2. The contribution of the agricultural sector to the GDP has increased from 28.7% in 1990 to 44% in the year 2004, with average annual growth rate 42.2%.
3. The contribution of industrial sector to the GDP increased from

15.4% in 1990/89 to 25% in 2004

4. The average per capita income has risen from $398 in 1990 to $ 660 in the year 2004 and with that, the Sudan stands number 51 out of 95 countries which categorized to be developing countries.

Agricultural contribution to GDP was 44% and employed 80% of the total work force in 2004 . Therefore, it played vital role and will continue to represent the most important economic sector in the Sudan with its huge potentials. The future of economic development in the country depends on agriculture , if it is carefully planned and given the top priority in the development planning. However, cotton, sesame, durra is among the main generators of exports earnings in the future because Sudan has comparative advantage in production of these crops.

As a matter of fact, agriculture of the Sudan is highly vulnerable to climatic conditions and is subject to volatile commodity prices. Yet, it is the hope and the way out to better living conditions of the people of the Sudan. Therefore, agriculture in the Sudan needs revolutionary actions. Oil revenues should fuel agriculture development through building the necessary infrastructure. Oil revenues will end up one day because oil as a limited resource will deplete sooner or later. But, agriculture is sustainable. So, Sustainable development is possible and it will come across agriculture if we could make correct and right strategies. In the coming lines the study elaborates more about agriculture and its potentials, and the policies concerning agriculture in the Sudan.

3.4 Agriculture of the Sudan:

Historically, agriculture in the Sudan goes back to3000 B C, the date which believed to be the history of human settlement in the Sudan, particularly alongside the river Nile valley. In that ancient times, agriculture has been flourished and enabled people to secure ample food. In fact, ancient civilization in the Sudan must indebted to agriculture because they were purely agriculturist. Without agricultural

production, particularly, provision of ample food, people couldn't have been able to settle and build these glorious ancient kingdoms like Kush, Marioh and the other famous ancient kingdoms of the Sudan.

For instance, during Kush and Marioh, agriculture witnessed some sort of developments, in the technology and in adoption of some new crop varieties (Elhafeyaan, 1997, p161).

From the days, of the ancient kingdoms, Christian, and Islamic kingdoms, agriculture of the Sudan did not witness significant improvements except introduction of shifting cultivation in kordofan beside adoption of, for the first time, agricultural credit system known as' sheil' system in Funj sultanate; the system still working in many places in the Sudan. Also, improvement in irrigation system using' shadouf 'and 'saggia' ,water wheel, as crucial tools of irrigation were discovered.

In the Turkish era, some important developments have taken place in the agriculture of the Sudan. These were represented, in the introduction of Gum Arabic and cotton as cash crops, and the use of pesticide for crop protection (Elhafeyaan, 1997, p171).

During Mahdest period, no significant developments in agriculture were recorded. In fact, the country was facing political unrest .The country was confronted with security challenges outside and inside the country. Wars across borders and mutinies from insides. Therefore, the priority of that time was to win these wars through the arm struggle. So, all the Sudanese, including farm producers, were gathered either as soldiers fighting in the battle fields or reserve army ready to join battle field s. However, limited flood irrigation system has been developed in some parts of the eastern Sudan, mainly in 'khor Tokar' and' khor Baraka ' , because eastern Sudan was relatively stable security wise (G. M. Craig,1991, p93).

Actually, colonial period in the Sudan, which extended from the year

1898 to the year 1953, witnessed the most influential developments in the agriculture of the Sudan compared to what has been done in the agricultural development in the previous periods. As is known, the ultimate goal of the colonial authorities is always extraction and looting of the resources of the colonies. Therefore, it was natural for the colonial authority in the Sudan to focus on exploiting the natural resources of the country, particularly, agricultural resources. After one year of being in the Sudan i.e. in 1899 the State governor Lord Kutchiner issued a number of directives to organize the use of land and the land tenure among the Sudanese as prerequisite to utilize agricultural resources in the Sudan. Accordingly, it became possible and official for individuals to register land and for the government to intervene and organize land use and land tenure. Moreover, the colonial authorities took a series of steps to establish a number of institutions for the same purpose as follows:

1. Agricultural and Lands Department, to organize land use to the citizens.
2. In 1902 Woods and Forests Department to conserve forests and provide woods for domestic use as fuel for river steamers.
3. In 1903 Welcome Research Laboratory, to conduct some initial studies in agriculture.
4. In 1904 Central Experiment Farm in Shambatt.
5. Department of Agriculture and Forests in 1911.

But the most salient contributions of colonial authorities in the development of agriculture of the Sudan remains as follows:

a. Introduction of water pumps system in irrigation alongside the river Nile valley.
b. Construction of Sinar dam and the establishment of the giant Gezira scheme, one of the biggest irrigated schemes across the world.

c. Establishment of Agricultural Research Centre of the Sudan.
d. Building of a number ginning industries and organizations of cotton trade.
e. Introduction of mechanized rain fed agriculture.
f. Introduction of agricultural education to help in development of agriculture.
g. Expansion of forestry and the conservation of forests.

Basing on the above mentioned facts, the study could say colonial authorities have done good job in the Sudanese agriculture by providing the basic infrastructure needed. Of course, without forgetting the real intension of the colonials in the extraction of the national resources as drawback in one hand. On the other hand the colonial policy in agriculture was not comprehensive to include every part of the country. The southern part of the Sudan was included which constituted the main weakness of the colonial agricultural policy. It is noted that, the policy of the colonial is concentrated towards the southern part of the country, particularly, the central part.

Indeed agriculture is the dominant sector in the Sudanese economy and is certain to remain the most important sector with its huge potentials. So. since the independent in 1956, contribution of agriculture to GDP has consistently been highest among all sectors of the economy. It contributed 57% to the GDP in 1959/60, over 39% in 1964, and maintained an average 35% from 1966 to 1980/81 and 31% for the period 1987- 1992. Despite of this, contribution of agriculture to the GDP shows declining(Medani, 1993, p3).

The successive national governments who took power after the colonials were over, inherited economy solely dependent on agriculture. This agriculture was composed of traditional rain fed agriculture, livestock breeding in the traditional way, and other types of agriculture such as irrigated and mechanized rain fed agriculture.

The economy of the Sudan, in the first day of its independent, reads as the following (Elhafeyaan, 1997, p181) :

- 97% of the total hard currency comes from the exports of agricultural products.
- 75% of the total loans from the bank of Sudan go to meet agricultural production requirements.
- 71% of the total hard currency comes from cotton to treasurer of the Sudan.

From the year 1961 and onwards, economic development planning in the Sudan was substantially related to agricultural development. Agriculture was representing the back bone of the economy and the source of livelihood for the majority of population. But, agriculture was divided in to two main sectors .One receives more attention of the government, that is the irrigated agriculture, and the other receives less attention, that is traditional agriculture.

From the year 1961 onwards, all development efforts were focused on agricultural development but confined to irrigated agriculture. Managil Extension, the 'Halfa Elgadida ', 'Tokar' and 'Lagash', 'Alsoki', 'Alrahad',' Abu habil', Western Sinar, Kenana, Mangala, Malloot, and the pump schemes alongside the Nile, are all irrigated schemes which existed in that period . 90% of these schemes are confined to an area not exceeding 20% of the total area of the Sudan. This area is where water for irrigation is accessible throughout the year and where infrastructure particularly, transport and labor force is accessible(Elhafeyaan,1997, p183). In addition, there are some factors that played significant role in concentrating development efforts in irrigated agriculture in this definite area such as:

a- Construction of Erousarus dam which enhanced potentials of extension in Gezira scheme in Managil area and other areas.

b- Construction of High Dam resulted in flooding the cultivable land of the Nubians behind the dam. Due to this the Egyptian government compensated the Nubians with enough money that helped in building the New Halfa Scheme in 'Cashim Elgrrba' area instead of 'Halfa Elgadeema'.

c- Construction of ' Gabel Awulya' Dam helped in establishment of livelihood schemes alongside the White Nile River.

Indeed, the period after independence of the Sudan, in relation with agriculture, is characterized by clear and systematic agricultural policies compared to the period before independence, which characterized by dubious policies and unorganized agricultural directives.

3.5 Agricultural Policies in the Sudan:

As is said above, the phenomena that characterizes the Sudan agriculture after its independence, is the application of clear and systematic agricultural policies as opposite to what was happening before independent. However, some unorganized agricultural policies were running during the periods before the national government came into power.

So, Sudan agricultural policies can be categorized into four periods (Abdelgabar, 1997, p31) as follows:

1. Pre-independence period (the Turkish and the colonial periods), where agricultural policies focused on the promotion of cotton growing and exports crops, while agricultural development remained limited.
2. Independence period (1956-1969). In this period, the colonial type of agricultural policy continued. This policy, as is outlined previously, neglected traditional rain fed agriculture and focused, beside that, on expansion of mechanized farming and monetization of the livestock.
3. Third period starts from (1969-1977/1978). This period was

characterized by the persistence of the colonial bias against traditional rain fed agriculture, the continuation of the unplanned expansion of mechanized agriculture, a decline in productivity as a result of the nationalization of private pump schemes, a strategy of substituting food imports through horizontal agricultural expansion as well as the promotion of agro-industries.

4. The last and the fourth period, extends from the year 1968 up to the present day. This period, characterized by negative results of stabilization policies on agro-industrial expansion programs. Exports initiatives and rehabilitation programs have been directed towards irrigated schemes, neglecting the traditional rain fed agriculture. As far as mechanized rain fed agriculture is concerned, there was no clear control on it.

To transform, mainly, the traditional agriculture in the Sudan, four approaches were followed(G.M.Craig, 1991, p448):

1- Single limiting factor approach.
2- The minimum package program.
3- The nucleus plantation approach.
4- The integrated regional approach.

The above approaches constituted the most important path a reform of traditional agriculture. Concerning Nuba Mountains and Darfur, the integrated regional development has become the most important approach of development.

Whatever the evaluation of people about the effects of agricultural policies in the Sudan, the reality and the impacts on cultivators must prove the inadequacy of these policies. Today, farmers across the Sudan are facing food shortages as one of their main problems. Their life is not yet transformed from that misery stage into better living conditions as stated in the objectives of agricultural policies. life of farmers elsewhere in the Sudan is not promoted but the reverse seems happening. But, the

question must be asked is, is agriculture alone can be way out for the poverty of those who are engaged agricultural sector? I think agricultural policies alone cannot reduce or alleviate poverty of smallholder farmer in particular. These policies need to integrated and supported with other non- farm economic policies. Some smallholder farmers who have adequate assets can empowered to start commercial production, and those who have no assets or limited assets can be empowered to get wage employment(IFAD, 2010, p184).

3.6 Agricultural Potentials of the Sudan:

It is estimated that the total area of the Sudan, before secession, is 598 million feddans of which about 200 million feddans are cultivable land. What matters most is not how large and available land is to determine development potentials. It is the availability of water that determine whether the available land has development potentials or not. Hence, the importance of soil is reflecting more in its water-holding capacity and less prominently in its acidity or alkalinity (El-Battahani, 2009, p29)

Actually, the fast arable land of the Sudan and the climatic diversity, supports the country to become one of the major food baskets for the world, particularly, water sources are abundant.

Rain fed agriculture is possible in more than half the total area of the Sudan. Except the far north where irrigated agriculture is possible along the banks of the Nile, the rest of the country has enough access to rain fed agriculture.

Irrigated agriculture, is possible also in the Sudan, in a wide spread area. Potentials for irrigation, are abundant from a wide range of rivers and their tributaries and from the underground water reservoirs in the Sudan.

Sudan has diversified water sources the most famous are rivers. For instance, White Nile river which runs from Lake Victoria and joins Blue

Nile river at Khartoum to form the river Nile which has other tributaries. So, the valley covered by these rivers is an immense cultivable area and provide the country with huge production potentials and crop diversity possibilities.

Also Sudan, is rich in natural pastures which enable the country stands in front lines among countries breeding livestock and its products. However, the country's livestock is mostly traditional. But, this does not deny the fact that Sudan has an advantage and access in producing commercially, a range of different types of animals; cattle, goats, lambs, camels……etc.

In addition, Sudan has tremendous potentials in fisheries and forestry.

3.7 The Nuba Mountains:

3.7.1 Introduction:

This part of the study aims at providing background information about the Nuba Mountains as a region and the local small farmers, with particular focus on the socio-economic conditions of the smallholder farming households. The necessary information are collected from the previous studies about the region as well as field data of the study. So, this part of the study consists of the location , physical characteristics, and the climate of the region, the Nuba people and the native administration, Nuba cultivation, land tenure among the Nuba people, the condition of the public services, and the forms of Nuba labor organization.

3.7.2 The location, physical characteristics, and the climate:

Nuba Mountains is an area located in the greater Kordofan region of the western Sudan. It is located in the centre of the Sudan and lies between29 and 31N and 10 and 12 E. The total area is roughly 30,000 square miles (Nadel, 1947, p2).

The area of the Nuba Mountains is covered by series or isolated range of Rocky Mountains, between which lies an extensive vast and fertile plains where most agricultural schemes exist.

Geographically, Nuba Mountains consist of a number hill-masses made up of variety of rocks of the basement complex, particularly soda granites, which weathered, to form a dome-shaped sugarloaf hills with bare rocky top and steep sides (Abdelgabar, 1997, p37).

The climate of the Nuba Mountains closely resembles to that of the surrounding plains. Actually, the international convergence zone that oscillates from north to south each year influences the climate of the region. This oscillation makes a shift in wind direction from south to north, carrying moist air over the area that with ascending air causes convention rains. This usually starts at the beginning of May when the first erratic rains begin. The area remains under this influence until the end of October when the winds start to change from south to north bringing dry air. The dry period lasts up to April. So, four periods are recognized: the rainy season from April to October, the harvest season from October to December, the cool dry season from December to February, and the hot dry season with north winds from February to mid April.

It worth mentioning, that rain fall in the Nuba Mountains, in general, is distinctly heavier and starts earlier in year. Also, the entire area of the region is characterized by savanna-type natural vegetation, with major local variations reflecting clay or sandy soil types.

According to soils survey records, the total area of the region is about 31,049,480 feddans, classified according to its potentials as follows:

A -Soil of high potentials for rain fed mechanized agriculture as well as for forestry and pasture is about 10,940,100 feddans.

B -Soil of moderate potentials is 6,754,440 feddans

C -Soil of low potentials for mechanized farming, but suitable for traditional agriculture, forestry and pasture is 7047,180 feddans.

D -Poor soil that suits only pasture is 2,622,760 feddans

E -The area of valleys, water courses, hills and rocks is 3,689,000 feddans.

So, basing on the above mentioned information about the huge resources, one can easily state that the future economic development of the region depends, significantly, on agriculture development and the empowerment of the poor peasants.

3.7.3 Socio-economic characteristics of smallholder farming households.

Based on filed data due to the lack of data at household level. So these characteristics include describing different variables such as age and sex distribution, demographic, social, and educational characteristics, which have been affected by the impact of agricultural intervention policies on the smallholder farming households of the Nuba Mountains. The aim is, to see to what extent, these characteristics can help evaluate agricultural intervention polices as empowering smallholder peasants or not. So, the variables tested are as follows:

a) Age and sex of the smallholder farming households members:

Concerning the composition of the age and sex of smallholder farming households members. The finds that, the percent of dependent children in the age group (0-14), is 25% of the total smallholder farming households members, with narrow variation in numbers between males and females, favoring males. In the age group (15 -29) the percent of smallholder farming households members is 35% with ,also, narrow variation in numbers between males and females, favoring females. In the age group (30-44) the percent of smallholder farming households

members is 22% with balance in the numbers between males and females. In the age group (45-59) the percent of households members is 10% with wide variation in numbers between males and females, favoring females. In age group (60+) the percent of the smallholder farming households members is 8% with wide variation in numbers between males and females, favoring males. In this age group there is marked variation between the proportion among males (6%) and that among females (2%). This is attributed, mainly, to the high rates of maternal deaths, particularly, during baby delivery as typically happens in developing countries due to disempowerment of people in health care facilities. Table 4.2.1below shows distribution of smallholder farming households members by age and sex:

Table 3.7.3.1 Distribution of smallholder farming households members by age and sex.

Age group(yrs)	Male		Female		Total	
	No.	% of total	No.	% of total	No.	%
00 - 14	195	13	184	12	379	25
15 - 29	250	17	257	18	507	35
30 - 44	161	11	161	11	322	22
45 - 59	64	4	88	6	152	10
60 +	87	6	32	2	119	08
Total	757	51	722	49	1479	100

Source: Questionnaire of the study, 2012

Accordingly, men dominate women in numbers , but the difference between the two is quite narrow, 51% for men compared to 49% for women.

b) Status of school attendance of the smallholder farming households members:

The percent of smallholder farming households members who attended school in age group(5-9) is 7% compared to 2% of not attended school in the same age group, and that there is wide variation between the proportion of people attended school and that of not attended school in the different age groups, favoring those who attended school in the young age groups. In age group (10-14) the percent of attended school is 8%, compared to 2% of not attended school and that there is wide variation between the attended and not attended school, favoring the attended school. In age groups (15-19), (20-24), (25-29), (30-34), and (35-39) the percent of the attended school are: 7%, 10%, 10%, 8%, and 6%, respectively, compared to 3%, 4%, 3%,2%, and 3% of not attended school in these age groups, respectively. In age group (40-44) and (45-49) the percent of people attended school is 3% and 2%, respectively, compared to 2% and 2% for those not attended school in the same age groups, respectively, with narrow variation between the numbers of attended school and that of not attended school, favoring, also, the attended school. In age groups (50-54), (55-59), (60-64), (65-69), and (70+) the percent of the attended school is 1%, 1%, 1%,1%, and 0%, respectively, compared to the percent 2%, 2%, 2%, 3%, and 2%, respectively in the same age groups and not attended before, with marked variation favoring people not attended school.

Accordingly, in the age groups of the young i.e. those less than 39 years old those who attended school are, markedly, outnumber those not attended school in the same ages. While, in the age groups of the aged i.e. 45 years old and above those not attended school are, markedly, outnumber the attended school in the same ages. Table **3.7.3.2** Below shows distribution of smallholder farming households members by school attendance:

Table 3.7.3.2 Distribution of smallholder farming households members by school attendance.

Age Group	Households members						Status of school attendance			
	Male		Female		Total		Attended school		Not attended school	
	No.	%	No.	%	No.	%	No. attended school	% of attended school	No. not attended school	% of not attended school
05 - 09	64	5	61	4	125	9	101	7	24	2
10 - 14	63	5	69	5	132	10	105	8	27	2
15 - 19	78	6	57	4	135	10	99	7	36	3
20 - 24	92	7	97	7	189	14	136	10	53	4
25 - 29	82	5	104	9	186	14	139	10	47	3
30 - 34	64	5	60	4	124	9	103	8	21	2
35 - 39	66	5	63	5	129	10	86	6	43	3
40 - 44	31	2	41	3	72	5	39	3	33	2
45 - 49	22	2	37	2	59	4	29	2	30	2
50 - 54	21	2	29	2	50	4	16	1	34	2

55 - 59	**21**	**2**	**22**	**2**	**43**	**4**	**17**	**1**	**26**	**2**
60 - 64	**25**	**2**	**17**	**1**	**42**	**3**	**11**	**1**	**31**	**2**
65 - 69	**33**	**2**	**10**	**1**	**43**	**3**	**7**	**1**	**36**	**3**
70 +	**29**	**2**	**4**	**0**	**33**	**2**	**6**	**0**	**27**	**2**
Total	**691**	**51**	**671**	**49**	**1362**	**100**	**894**	**65**	**468**	**34**

Source: Questionnaire of the study, 2012.

So, this table indicates the improvements in educational opportunities for the young population of the Nuba Mountains, but these opportunities still insufficient to make everybody feel educationally empowered.

c) Educational attainment of the smallholder farming households

There is wide variation in educational attainment between males and females, favoring males in the Nuba Mountains as is shown in table 4.2.2. This variation looks less wide in the Basic level and becomes wider and wider in the High and Post graduate education levels . In Basic Level the percent of males is 54% compared to 46% for females, with net variation reaching 8% . In the High level the percent of males is 59% compared to 41% for the females, with variation reaching 18%. In University level, the percent of males attaining education is 47% compared to 41% for females, with net variation shrinking to 6% . In Post graduate level, the percent of males is 87% compared to 13% for the females, with net variation widening to reach 74%. Table below shows educational attainment in the area of the Nuba Mountains:

Table 3.7.3.3 Distribution of educational attainment of smallholder farming household members by sex and levels of education.

Sex	Levels of education								Total	
	Basic		High school		University		Post graduate			
	No.	%	No.	%	No.	%	No.	%	No.	%
Male	311	54	128	59	47	53	7	87	493	55
Female	269	46	90	41	41	47	1	13	401	45
Total	580	100	218	100	88	100	8	100	894	100.0

Source: Questionnaire of the study,2012.

Accordingly, smallholder farming households are , in general, educationally empowered . But, females education is lagging behind males education. Therefore, women in smallholder farming households are , educationally, less empowered compared to men, beside, education opportunities in University and Post graduate levels, for both males and females, are less improved .

d) Demographic characteristics of smallholder farming households members.

Average family size in the area of the Nuba Mountains is (6.3) i.e. around 7. The percent of dependent children is 25% . Sex ratio indicates domination of males in any given household. Dependent children (0-14) and dependent aged (65+) together form dependency ratio (.31) i.e. more than 30% of the total population, which typically indicate one of the characteristics of developing countries, where these dependency ratios are usually high. Active population (15-65) is .69 which is, amazingly, high and indicates productive potentials of the smallholder farming households if provided by ample means of production. Table**3.7.4.4** below shows demographic characteristics of smallholder farming households.

Table 3.7.4.4 Demographic and characteristics of smallholder farming households.

Characteristics	Calculations
Sex ratio(Male/Female)	1.05
Male proportion	0.51
Dependent children(0-14years) proportion of population.	0.25
Dependent aged(65+years)proportion of population.	0.05
Active population(15-65yrs)proportion of population.	0.69
Dependency ratio	0.31
Average family size	6.3

Source: Questionnaire of the study,2012.

d) Under-5 infant mortalities:

On average, under-5 infant mortalities occurring to smallholder farming households throughout their life course in the area is 0.94 i.e. around 1 death . Accordingly, any given household in the area, has witnessed, approximately, 1 death of under-5 infant, which is, markedly, high and is quite similar to that of poverty-stricken people. Distribution of under-5 mortalities is shown in table**3.7.5.5** below:

Table 3.7.5.5 Under-5 infants mortalities of smallholder farming households.

Total no. of households	No. of under-5 infant mortalities				Total under-5 infant mortalities	Average under-5 infant mortalities
	Male		Female			
	No.	%	No.	%		
236	118	51	112	49	230	0.97

Source: Questionnaire of the study, 2012.

This indicates that smallholder farming households are facing poverty, and that levels of their incomes are below the levels required to cover basic needs of the household.

e)Migration among smallholder farming households:

The percent of total migration among smallholder farming households members is 10%. From which, the percent of inside the Sudan migrating households members, is 7%, compared to 3% for outside the Sudan migrating households members.

Regarding the distribution of migrating households members by sex, the table below shows wide variation in the proportion between males and females migrating inside and outside the Sudan. This comparison, always, favor males. The percent of males migrating inside the Sudan is 5%, compared to 2% for females migrating inside the Sudan. While, the percent of males migrating outside the Sudan, is 2.8% compared to 0.2% for females migrating outside the Sudan. Table below **3.7.6.6** shows the status of migration among smallholder farming households in the area:

Table 3.7.6.6 Migration status among smallholder farming households members.

Sex	Total households members		Migrating households members					
			Inside Sudan		Outside Sudan		Total	
	No.	%	No.	%	No.	%	No.	% of the total households members
Male	757	49	69	5	42	2.8	111	8
Female	722	51	33	2	02	0.2	35	2
Total	1479	100.0	102	7	44	3	146	10

Source: Questionnaire of the study,2012

So, the table indicates that the proportion of smallholder farming households members who are migrating is not small. Accordingly, the expected remittance they send home to their households is expected to enhance further investment in farm production.

f) Remittance status:

The percent of permanent remitters is 15%, remitting sometimes is 22%, and not remitting at all is 63%. Permanent remitters who remit in-kind is 9%, compared to 91% for those who remit cash. While, the percent of sometimes remitters who remit in-kind is 9%, compared to 91% for sometimes remitters who remit cash. Average remittance is 1144 SDG is unexpectedly considered small sum of money, compared to the percent of emigrants. Table **3.7.7.7** below shows the distribution of emigrants of smallholder farming households members by status of remittance:

Table 3.7.7.7 Distribution of emigrants of smallholder farming households members by status of remittance.

No. households	Permanent remitters						Remitted sometimes						Not remit at all		Total emigrants	Average remittance (SDG)
	No.	%	In-kind		cash		No.	%	In-kind		cash		No.	%		
			No	%	No	%			No.	%	No.	%				
236	22	15	2	9	20	91	32	22	3	9	29	91	92	63	146	1144

Source: Questionnaire of the study, 2012.

So, this indicates that incomes of emigrants are low due to the minor and low wage positions they occupy. Also, it indicates that, these small sum of money will not help smallholder farming households in making efficient investments in their farms.

3.8 The Peoples of the Nuba Mountains:

a) The Nuba and the Nuba modern Sudan:

according to Nadle in his famous book "The Nuba" 1947, Nuba, is collective term used for the peoples who inhabit the Nuba Mountains in the Sudan. Although, the term is used to describe Nuba as if they are composed of a single group, they are a multi distinct peoples who speak different languages .

R. C. S. Stephenson, the linguist, 1985, Nuba are grouped into 10 linguistic groups and reside Nuba Mountains which administratively belong to Southern Kordofan State. So, Nuba are a number of tribes, who do not claim common origin, but share deep rooted neighboring hood and experienced historical events such as slave raids, marginalization and domination of their economy by the Jalapa group. Their original place i.e. the previous place of their settlement before the area of the Nuba Mountains is still controversial among the historians and anthropologists because writings of ancient history of the Nuba is not available. So, some authors and the historians assume that Nuba have lived in the area of Nuba Mountains, or more precisely in Kordofan region, since a very long time . Nuba themselves, when they are asked about their previous places of settlement, they reply that" we have always lived here in the Nuba Mountains" to indicate that they are indigenous people of the area. However, some of the Nuba people claim that they are descended from the Nubians of the far north of Sudan, and some writings try to confirm this claim. So, from far north they have driven south wards, to where they are now, due to internal clashes as well as the advent of outside invaders, mainly, the Arab intrusion to the

Sudan (Abdelgabar, 1997, p51).

During the Turkish period in the Sudan, the area of Nuba Mountains was viewed as a source of slaves. Looking for slaves to recruit in their army, was one of the main factors behind the Turkish invasion to the Sudan in 1821. Pallme in his book "Travels in Kordofan" 1944, writes that the Viceroy of Egypt undertook actual hunts once or twice in the Nuba Mountains and neighboring countries. The objectives of the Viceroy, was to capture men of Nuba people for his army, or sell them in the slave market to increase his revenues and to bring gold which was explored also there. Pallme, added that thousands of people were felt captive, and by the year 1839 the number of captive people reached to at least two hundred thousand. In short, Turks viewed Nuba Mountains as mines for slaves and gold. However, during this period trade has expanded and developed between the area and the Nuba Mountains. Also, a salient development has taken place in that period which is the beginning of Christianity mission in the Nuba Mountains, which participated in the diffusion of education through the missionary schools.

In Mahdest time, some of Nuba people were reluctant to join Mahdest mission. Therefore, Mahdi and his Khalifa fought them to surrender. However, some of the salient leaders of Mahdest regime were from the Nuba Mountains like Hamdan Abu anja and Elnur Angara.

In the condominium period, Nuba were forced to change the way of their settlement. Nuba seeking security, they took refuge on the foothills or tops of the mountains, but the condominium government succeeded to bring them down i.e. down-migration of the Nuba out of the mountains, to help administer and control the people and to make their areas accessible for services such as health, education, and agricultural facilities. Furthermore, cotton was introduced in this period as cash crop for the first time in the history of the area. In fact, cotton, was imposed, indirectly, on Nuba cultivators; it coincided with imposition of taxes, for

every Nuba man of 18 of age, to be paid in cash instead of in kind, within an economy not yet transformed into monetary economy. So, Nuba cultivators left with no choice because the demand for money to pay the tax become high, and the only source of money at that time was to grow cotton, although, they were not convinced to grow cotton.

In fact, Nuba are not the only inhabitants of the Nuba Mountains, there are other tribes who came into the area in the different stages of history looking after different interests.

b) The Baggara:

Among the other groups of tribes, Baggara tribe is the second tribe after the Nuba in terms of population size. Baggara who claim Arab origin, are principally nomads and came to the area, approximately before 1800, searching for water and pastures for their animals .

When Baggara came into the area, Nuba were living on the plains but driven to the top of the mountains looking for security shelter. In fact, Nuba must owe a lot to these mountains, because they have protected them from dangers. Without the mountains Nuba race may have died out.

It is worth mentioning, that the advent of Baggara in the Nuba Mountains coincided with activities of slave trade in the area and Baggara get involved in this type of trade by hunting the people. So, they are always being accused by their fellow Nubians of participating in that inhuman type of trade. This element may have created some sort of psychological barriers in the social interaction between the two groups. Moreover, Baggara through their alliance with colonial authorities have been able to exercise lordship over the Nuba (Atta, 2009, p101). Nevertheless, Nuba and Baggara have grown, through their coexistence and mutual interaction, good relationships resulting in intermarriages and the development of a sense of unity in diversity.

Both Baggara and Nuba peasants have been affected negatively by the government intervention policies. For instance, Baggara used to move, freely, from place to place look for water and pasture for their cattle. But this free movement is restricted by the demarcation of big mechanized schemes in the plains. This has affected pastoral routes, accordingly, the access to vast pastures in the plains is diminished to the minimum.

Many Baggara members today are changing their way of life. Many of them, started to settle down, instead, of moving and wondering with their animals. The career of keeping animals is no longer attractive to Baggara than ever before, due to the intervention policies which favored, always, agriculture sector, particularly big farming schemes, more than animal keeping and small scale agriculture.

It is worth mentioning that the purpose of Baggara in keeping animals is not for economic purposes, it is for the social purpose. Baggara appreciate accumulation of cattle because they think, culturally, maintaining social status or social prestige is connected to having a good number of cattle.

c) The Jalapa:

"Jalapa" is an Arabic term which means importers and is referred, in local Sudanese dictionary, to northern traders who came in the area of Nuba Mountains since the Turkish era, searching for economic interests through engaging in petty trade. Initially, Jalapa were small and ineffective group but later grown to become an important pillar of monetizing the whole economies which were at that time pre-capitalist economies (Atta, 2009, p73).

Jalapa, in terms of their number and size as a group is very small group compared to other groups of the Nuba Mountains. But, they remain always the most influential group in structuring political and economy policies. Therefore, these policies, are accused by some local elites, as

been representing the interest of Jalapa and not the interests of the local communities.

Jalapa started to penetrate Nuba Mountains since Turkish era through trading on petty trade with small capital. The type of their trade, initially, was that type of moving across villages and towns carrying goods on horses, donkeys, camel's back…etc.

Looking for more profits, the Jalapa started to reside in the towns and villages and practice cultivation of cash crops like sesame, using hired labor from the local communities. Consequently, production relations formed to organize the work between hired labors and the Jalapa traders. Unfortunately, these relations were not organized in fair deals. Local communities feel that Jalapa were cheating them by giving them low wages compared to hard work they did in their farms.

In fact, Jalapa and their relation with mechanized farming schemes is an important history. The first pioneer of mechanized rain fed farming in the Nuba Mountains was a Jalapi, singular of Jalapa, residing in Dalanj town (Atta, 2009, p35). Most of the rain fed mechanized schemes were owned by Jalapa traders because they have met the required conditions, while others failed to meet the condition of mechanization of the scheme. It is worth mentioning that the conditions were; being Sudanese, having experience in agriculture, and having some sort of mechanization like tractor or disc.

Finally, Jalapa have become part of the community in the area and nobody could neglect them in any future arrangements of the Nuba Mountains.

3.9 Nuba Cultivation:

Historically, the main economic activity among the Nuba people has been subsistence agriculture. However, Nuba breed some animals such as cattle and goats. Also, they practice hunting wildlife during summer

season when they are off farm activities. They do all these activities using simple tools .The tools of economic activities used by Nuba people are principally represented in the following (Abdel Gader,1998, p43):

1. Sulukab, a kind of hoe and consists of two parts: an iron head made by a blacksmith and a wooden handle prepared at home by the farmer from the forest. The function of "sulukab" is to break up soils for sowing and the "sulukab" cultivation is always term given to traditional agriculture as opposed to tractor agriculture.
2. Hashasha used in weeding and removing parasite plants and is shorter than sulukab and with curved handle.
3. Turia, a kind of hoe use for land terracing and weeding. It consists of iron head and short stick. Turia is originated from West Africa and entered Nuba Mountains with the advent of Hausa, Burgoo, and Bruno from the western Sudan.
4. Fuss is an ax used to cut down the trees and the bushes as necessary preparation for cultivation. Fuss is, made up of iron head and wooden handle and is locally prepared tool.
5. Tardy is a small flat iron tool with a sharpened edge used to cut sorghum, sesame, and millet during harvest season.
6. Mud gaga, is a tool used in threshing sorghum and millet. It consists of two parts: a flat head and long thick stick curved to fit in the head. but the mud gaga used in sorghum threshing differs a little pit from that used in the millet threshing in that the former is narrower in the head than the later.

These tools are still widely used by the Nuba peasants. The majority of farmers are still using this kind of simple tools, despite many that have changes taken place, which make these tools ineffective in the present time. Probably, this problem exists due to the subsistence nature of production of these communities, which reserve no surplus to be accumulated for the purpose of tools development, or because government credit policy is inaccurate to help the people to develop

their technology of production, or both are true.

I) Types of Nuba Farms:

In fact, Nuba cultivation has been closely related to the settlement patterns of the Nuba people. As is said previously, that Nuba people seeking security from slave traders or their agent Baggara, have taken foothills land tops of the mountains as shelters of accommodations. From there, they organized very strict cultivation system. This cultivation system include; the type of the farms, crop varieties, and the duration of cultivation operations.

Usually, Nuba have three types of farms as follows:

a. House farm or near farm, very crucial type of farm in the life of the farmers because it provides them, when the previous stock run-short, with vegetables and grains from early- maturing sorghum and maize.
b. Hillside farm, is wider than the house farm and too far from the settlement which is often in the top of the hill or the foot hill. The crops cultivated here, are usually sorghum, sesame, and millet.
c. Far farm is in the fertile plain which is often far from the settlement. Sometimes the whole family or part of it moves to settle, temporary around it, during cultivation operations to save time and effort. It is worth mentioning, that Nuba farmers used to practice a shifting type of cultivation in far farms. This shifting cultivation, proved to be a successful type of agriculture, particularly, when it uses harig system i.e. burning the mature grass to destroy the growth of the young one and clean the land for cultivation. This process increases productivity of the farm and reduces working costs because it reduces subsequent weeding on the farm.

In fact, the second type of farms i.e. the hill side farm is no longer crucial as before, because most people in the area have migrated down from

the tops of mountains towards the plains, hill side farms were important when people were settling on the top mountains or the foot hill.

Concerning the duration of the cultivation operations in the far farms according to (Abdel Gaber,1998, p47) the following are the primary cultivation operations of Nuba farmers:

Month	Agricultural Operation
May-June	Grass burning and sowing of sorghum and sesame
June-July	First weeding
August- September	Second weeding
October	Cutting of sesame
November-December	Threshing of sesame and cutting of sorghum
January-February	Threshing of sorghum
March-April	Field cleaning of sesame and sorghum.
May	Start of new season

Generally, Nuba farmers cultivate different crop varieties principally for their own consumption. So, they produce Dura the stable crop, sesame, okra, ground nuts, beans, millet, vegetables, water melon, and cotton which is introduced 1920s as cash crop.

ii) Land Tenure and land use in the Nuba Mountains:

As an indigenous people, Nuba claim that Nuba Mountains is their original homeland. Accordingly, they believe to have historical rights over the land. They have been existing here even before the Sudan as a country is demarcated. Therefore, they deny the right of government to

intervene in the land issue. Basing on this believe, Nuba developed and organized a type of land tenure based on communal, and land use system based on shifting and slash and burn cultivation.

Broadly speaking, there are two types of land ownership in the Nuba Mountains that is individual and communal ownership. Actually, every tract of land in the Nuba Mountains, that is under cultivation or once being under cultivation is individually owned, and that is not cultivated land, is communally owned (Nadel, 1947, p47). So, individuals have complete property rights over the land they used to cultivate and once they have cultivated. Also, as community members they have collective right over the land within the territory of tribe or community.

In fact, people in the Nuba Mountains acquire, traditionally, land ownership through the following methods (Takola, 2003, p15):

1. By clearing and cultivating the new land of local community, every tribe member has a right to choose whatever uncultivated land within the territory of the tribal land and make it his own farm.
2. Through inheritance.
3. By purchase.
4. By lease or similar forms of temporary transfer.

But, the above methods have changed, tremendously, in the last three to four decades, particularly, after the initiation of big mechanized schemes and cotton growing farms of modernization schemes.

iii) Forms of Labor Organization in the Nuba Mountains

The traditional forms of labor organization in the Nuba Mountains are primarily two forms (Abdel Gaber, 1998, p47):

a. Family labor represents the basic production unit i.e. the regular team of work which consists of a man, his wife or wives, his unmarried daughters and sons.

b. Group labor, locally known as" Nafeer" which is necessary in agricultural tasks beyond the family labor ability. It requires, invitations of neighbors for one day work, and providing them with food and drinks. Such, labor is of reciprocal nature i.e. peasants receive mutual help in critical agricultural operations.

Labor is not organized in such a way that the labor is divided in gender basis. In fact, men and women do the same work. That kind of specialization according to gender is infrequent and is limited to only bringing fire wood, water, grinding grain, and brewing Marisa which is locally made drink from sorghum.

c) Hired labor

In the past, this form of labor was less significant compared to the rest of the labor forms, because family labor constituted the main unit of production. Today, it is getting more significant due to the difficulties surrounded with family and group labor.

In the present day, two of the traditional forms of labor organization i.e. family and group labor, are disappearing. The family labor which represented the core unit of production, for a long period, is fragmented today. The composition of family labor, is falling apart. Young children are attending schools instead of going to the fields. The youth are not staying at home, they used to go to towns and cities looking for labor, instead of helping the family in farm tasks. So, the remaining of the team is only a man and his wife or wives and cannot compensate the labor of the absentees members of the family. Also, common labor is no longer significant as before, because farmers look at it as costive labor and less practical compared to the wage labor which was not familiar in the past but more common today (Takola, 2003, p17) .

To conclude this chapter, it is important to state that the relation developed between Nuba Mountains and the various governments of

the central Sudan was of an extractive nature. Extraction has started during the intrusion of the Turkish to the region for slaves and gold, for cotton and taxes during the condominium period, and for sorghum, sesame, livestock, and cotton in the period after independence (Abdel Gader, 1998, p49) .

In fact, during the three periods mentioned above, no serious attempts are made to develop the region . Even the few development projects implemented were of extractive nature, and didn't benefit the local people. And, the result was the civil war that broke out in 1983 as a direct consequence of these inadequate attempts of development.

The coming chapter is solely devoted to the field study and the processing of the field data. The processed data are discussed, also, in that chapter to reach the necessary indicators and results.

iv) Systems of cultivation in the Nuba Mountains:

Like the rest of rain lands in the Sudan, in the Nuba Mountains there are three main systems of cultivation as follows(J.D. Tothill, C.M.G, DSC, B.SA,1948, P291):

1- Shifting cultivation.
   This system of cultivation necessitate availability of land beyond the need of farmers. In this case every farmer has more than one farm. He continue cultivating one farm for a period of time and when it gets losing fertility then he shifts to another new site to make his farm practices. When this new site start to lose fertility, he shifts again to a new one. He keeps doing so, until he come back to his initial farm after it has been restored the necessary fertility. This type of cultivation always grantee ample production, because the land farmer cultivate is always fertile.

2- 'Harig' cultivation.

'Harig' cultivation is the second system of cultivation exist in Nuba Mountains. It entails sufficient mature grass of the previous season to be burned when the new grass is grown sufficiently. This process reduced the cost of weeding and thus increases the returns.

3- Mixed cultivation.
In this system, the land is intensively cultivated for several years. Therefore, using fertilizers is necessary and this in turn makes this type of farming rather costive. Fortunately, this system is limited in the Nuba Mountains.

CHAPTER FOUR

SAMPLE AND DATA ANALYSIS

4.1 Introduction:

This chapter is concern with processing, analyzing, and discussing the data collected from the study area. The objective is to determine whether agricultural intervention policies have led to the empowerment of smallholder peasants of the Nuba Mountains or not?

As is said earlier in chapter two, two questionnaires have been designed to collect the necessary data from the study area. One questionnaire deals with quantitative data. While, the other deals with qualitative data.

Although, the two questionnaires targeted and distributed to the same sample of the study, each of them is separately processed, analyzed, and discussed, using different tools of data analysis.

4.2 Sampling:

So, two steps are followed to reach the suitable sample size of the research as follows:

Step 1.

Using the formula of sampling from unknown population size:

$$n^* = (z)^2 / (d(1-d))\, S_r$$

Where:

n* = sample size of the unknown size of population.

Z= standard value at level of confidence 95%.

d= degree of difference among respondents.

S_r= sampling error (given at .o5).

Step2.

Check the previous sample size(n*) by using the following formula, to correct the sample size:

$$n = \frac{n^*}{1 + \frac{n^* - 1}{n}}$$

Where:

n=sample size

N=size of the study population.

So, accordingly:

n = (1.96⁄ 0.5)^{2}X (0.5 (1- o.5))

= (1536.64) (0.5(1-0.5))

= (1536.64) (0.25) =384.16 approximately = 385

Since, the total population size of South Kordofan State, according to the 2010 census, is 2508268, and rural dwellers constitute76.53% of the total population. Then, the population study from the selected localities is 1919578 .

Therefore, the modified and the correct sample size(n) is :

$$n = \frac{385}{1 + \frac{385 - 1}{1919578}} = 384.923 \approx 385$$

So, the sample size (n) is 385+ 15 reserve in case of some damages or some forms got lost. Therefore, the sample will be 400 respondents and is distributed among the five old localities of the Nuba region ; Dilling, Rashad, Talodi, Lagawa, and Kadugli, according to the size of population in the locality as follows:

Locality	No. of respondents	%
Lagawa	119	30
Kadugli	103	26
Dilling	80	20
Talodi	35	09
Rashad	63	15
Total	400	100

In each of these localities, three villages are selected randomly represent the field of the study as well as households which selected in each of these villages at random base.

Therefore, this chapter is organized into two to parts, each deals with one of the two questionnaires.

For processing field data the study used, mainly, SPSS package for quantitative data to get frequency analysis , t-test, cross tabulation, gini coefficient….etc, of the different variables tested by the study. While for processing qualitative data the used five-likert method.

4.3 Part one:

This part deals with quantitative data. It is worth mentioning that some of the filled questionnaires were lost and others damaged in the re-entry period to lessen the sample size to 236. Fortunately, it's representative.

4.4 Factor market:

4.4.1 land:

The percent of farmers who have private ownership of land is 97%. The percent of farmers rented land is 3% . Accordingly, only two types of land tenure, privately owned and rent, exist in the area. This indicates that vast majority of farmers privately own land, compared to a minor group of landless farmers who depend on rent to practice farming. In fact, land in the area is communally owned. Everybody in his community have access to land within the territory of his or her community land by either of the traditional means mentioned before. The problem of this type of land acquisition is that land has no secure individual property or use rights. Therefore, land cannot contribute to improve access to credit which in turn improves investment climate in farm production (Nora, Karim,David,2007, p8). This process can widen the scope of revenues for farmers and enhance their lives. So, land reform in the area is necessary to empower farmers through establishing secure individual property or use rights over land. Table 4.4.1.1 below shows distribution of land by types of tenure:

Table 4.4.1.1 Distribution of land by types of tenure:

Types of ownership	No. of the farmers	%
Privately owned	230	97
Rented	006	03
Total	236	100

Source: Own field work of the study,2012.

a) Ownership and cultivated land:

In land size group (1-4) feddans, the percent of farmers who own land is 30%, compared to 30% of farmers who cultivated land in the same size group. In this, , the size of land owned is typical to the size of land cultivated. In land size group (5-9) feddans, the percent of farmers who own land is 22%, compared to 26% of farmers who cultivated the land in the same size group. Here, land owned is less than land cultivated, because land cultivators are more than land owners by 4%. In land size group (10-14) feddans, the percent of farmers who own land is 19%, compared to 21% of farmers who cultivated land in the same size group. Here again, land owned is less than land cultivated, and that land cultivators are more than land owners by 2% of farmers. In land size group (15-19) feddans, the percent of farmers who own land is 15%, compared to 16% of farmers who cultivated land in the same size group. Here also, land owned is less than land cultivated, because land cultivators are more than land owners by 1% of farmers. In land size group (20-24) feddans, the percent of farmers who own land is 4%, compared to 1% of farmers who cultivated land in the same size group. In this group, land owned is more than land cultivated, because land cultivators are less than land owners by 3% of farmers. In the size group (25+) feddans, the percent of farmers who owned land is 10%, compared to 5% of farmers who cultivated land in the same size group. Here also, land owned is more than land cultivated, because land

cultivators are more than land owners by 5% of farmers. Table 4.4.1.2 below shows distribution of farmers by size of land owned and land cultivated in the area:

Table 4.4.1.2 Distribution of ownership and land cultivated.

Size of land in group(feddans)	Farmers in land owned		Farmers in land cultivated	
	No. of farmers	%	No. of farmers	%
01 - 04	71	30	71	30
05 - 09	52	22	60	26
10 - 14	44	19	50	21
15 - 19	36	15	37	16
20 - 24	10	04	3	01
25 +	23	10	15	06
Total	236	100.0	236	100.0

Source: Own field work of the study, 2012.

So, this table indicates that farmers in group (1-4) feddans are neither leasers-in nor leasers-out; they cultivate solely the land they own. In land size groups (5 -9) and (10-14) feddans, farmers are leasing-in some land since their cultivated land exceeds their ownership. In land size groups (15-19), (20-24), and (25+) feddans, farmers either lease-out some land to some farmers who own land and some who are landless, or leave the land fallow.

3- Distribution of total land owned and cultivated:

The percent of the total land owned in size group (1-9) feddans which classified as smallholding, is 19.9%, compared to 80.1% for total owned

in land size group (10+) feddans classified as large holding. Also, the percent of the total land cultivated as smallholders .i.e. (1-9) feddans, is 52% of the total land cultivated, compared to 48% of the total cultivated land as large holdings. Table 4.4.1.3 below shows distribution of total land by size group.

Table 4.4.1.3 Distribution of total size of land (in feddans)

Size of land by group	Total land owned/feddans		Total land cultivated/feddans	
	Land	%of total owned	land	%of total cultivated
01-04	202	7.3	202	8
05-09	347	12.6	1163	48
10-14	507	18.3	597	25
15-19	596	21.6	191	8
20-24	208	7.5	144	6
25+	905	32.7	120	5
Total	2765	100.0	2417	100

Source: Own field work of the research, 2012.

If we read table 4.4.1.3 and table 4.4.1.2 together, we notice that 56% of farmers who are classified as small holders, own 19.9% of the total land owned and cultivate 56% of the total cultivated land, compared to 44% of farmers who are classified as large holders owning 80.1% of the total land owned and cultivate 44% of the total land cultivated.

It is noted that, there is higher inequality in land ownership between smallholders and large holders, but lower in terms of access to productive capacity of land as an assets. This is a result of interaction of both market factors and social arrangements. To compare inequality of land distribution(land owned and land cultivated) among the farmers

Gini coefficient is calculated using the following equation:

$$G = \frac{2\sum_{i=1}^{n} iy_i}{n\sum_{i=1}^{n} y_i} - \frac{n+1}{n}$$

Where: $_{yi}$, $i = 1^n$ index in non decreasing order $y\, i \leq y_i = 1$

So, table 4.1.2.3 distribution of total size of land is transformed through the above equation into the following table:

Table 4.4.1.4 Gini coefficient Test

Ranking	Land owned	Land cultivated
1	25	105
2	30	175
3	75	180
4	240	300
5	310	420
Total	680	1180
Gini	0.458824	0.255932

Accordingly, Gini coefficient for land owned is 0.458824, while for land cultivated is 0.255932. This indicates a more equal distribution of land among cultivators and more unequal distribution among land owners. Therefore, land tenure in the area needs intervention to make necessary land reforms within the context of empowering small farmers.

b) Efficiency of production

1) Dura production.

In each group of land size, aggregate output and the average output of Dura per feddan in kilos, is defined. In size group (1-9) feddans, which

classified as smallholding, the output is 361440 kilos and the average is 1181 kilos. In group (10+) feddans, which defined as large holding, the aggregate output is 107460 kilos, and the average is 604 kilos. In comparison between the average production per feddan of smallholders and that of the large holders, it is noted that smallholders produce higher production compared to large holders, because average output per feddan for the smallholder is 1181kilo, for the large holder is only 604 kilos. Table 4.4. 1.5 below shows Dura production by size group of land cultivated:

Table 4.4.1.5 Dura production by size group of land cultivated.

Size land by group	Total cultivated land(in feddans)	No. of farmers	% of farmers	% of land	Output /feddan	Average (kilo/feddan)
1-9	**710**	**97**	**49**	**27**	**361440**	**1181**
10+	**603**	**102**	**51**	**73**	**107460**	**604**
Total	**1313**	**199**	**100.0**	**100.0**	**468900**	**1785**

Source: Own Field work of the study, 2012.

Thus, small farmers, who hold small plots, have more productive capacity than large holders, who hold big plots. Therefore, for further production in the area, it is wise and feasible to depend on empowering small farmers. Small farmers can be empowered through empowerment projects such as; health care facilities, education, credit facilities, land reforms, laws and regulations..etc empowerment projects must be looked as strategic project for expanding production and increasing incomes.

For further test of the results , t-test is applied to compare the efficiency of production between group of small farmers and big farmers. Small

farmers are defined as those cultivating plots less than 10 feddans, while large farmers defined as those cultivating plots more than 10 feddans.

Table 4.4.1.6 t-test of productivity difference between small and large farmers.

Size of land by *group* of Dura	N	Mean	Std. Deviation	Std. Error Mean
Small famers	2	590.50	249.609	176.500
big famers	4	151.00	99.341	49.671

Independent samples test

Equal variances assumed	Levene's test for equality variances		t-test for equality of means		
	f	Sig.	t	df	Sig .(2-tailed)
	5.835	.073	3.348	4	.029

Source: Own Field work of the study, 2012

The results of the t-test show that, mean for small farmers is 590.5 kilo/feddan, compared to 151 kilo/feddan for the big farmers. So, the difference between the two means is amounting to 439.5 kilo/feddan, which is markedly significant and indicates the differential productivity based on land size, favoring small farmers who cultivate small plots less than 10 feddans.

Also, from independent sample test, we noted that t- value is 3.348 under degree of freedom 4 and Sig level .025 is less than .o5, which means the efficiency of production favor small farmers significantly.

2) Sesame production.

In each land size group, aggregate and average output of Sesame production per feddan in kilos, is defined. In land size group (1-9)

feddans defined as small holdings, the aggregate output is 79950 kilos and the average output is 411 kilos. In land size group (10+) feddans, defined as large holdings, the output is 14400 kilos and the average is 310 kilos. In comparison between production of smallholders and that of large holders, we note that production of smallholders is higher than that of large holders. Because average output of the smallholder is 411 kilos, while 310 kilos for the large holder. Table 4.4. 1.7 below Sesame production by size group of land cultivated in feddans.

Table 4.4.1.7 Sesame production by size group of land cultivated(In feddans).

Size of land by group	Total cultivated land(in feddans)	No. of farmers	% of farmers	% of land	Output/ kilo	Average output/kilo
1- 9	402	40	35	74	79950	411
10+	145	73	65	26	14400	310
Total	547	113	100.0	100.0	94350	721

Source: Own Field work of the study, 2012.

Accordingly, small farmers have more productive capacity than large farmers .Therefore, for further production in the area, more focus is needed to be directed towards small farmers, particularly, when considering empowerment projects

For further test of the results , t-test is applied to compared the efficiency of production between group of small farmers who cultivate small plots and that of the big farmers who cultivate large plots, as is shown below:

Table 4.4.1.8 t-test of productivity difference between small farmers and large farmers.

	Size of land by group of Sesame	N	Mean	Std. Deviation	Std. Error Mean
Average output of Sesame	Small famers	2	300.50	.707	.500
	big famers	4	78.25	52.296	26.148

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Average output of Sesame	Equal variances assumed	3.822	.122	5.666	4	.005

The results of the t-test show that, mean for small farmers is 300.5/kilos, compared to 78.25/kilos for the big farmers. So, the difference between the two means is amounting to 222.25/kilos, which is markedly significant and indicates the differential productivity based on land size favoring small farmers who cultivate small plots.

Also, from independent sample test, we noted that t- value is 3.666 under degree of freedom 4 and Sig level .005 is less than .o5, which means the efficiency of production favor small farmers significantly.

4.4.2 Labor market:

Labor market in the Nuba Mountains as one of the most important ingredients of the factor market, is traditionally organized into family, hired, and 'Nafeer' labor .

4.4.2.1 Family labor.

Historically, family labor remained the basic unit of production in household farm. In the past, the whole family was working together in a plot known as family plot. Today, a lot of changes in the team of family labor are taking place. In the size of the team or in the age and sex.

58% of the total households have family workers range (1 -2) workers. 31% of farming households have family workers range (3 – 4) workers. 7% of the farming households have family workers range (5-6) workers. 4% of the smallholder farming households have family workers range (7-8) workers. Table 4.4.2.1.1 shows size of family workers and its distribution in Dura and Sesame crops:

Table 4.4.2.1.1 Size and distribution of family workers in Dura and Sesame crops by sex.

Group of workers	Total households		Family workers in Dura crop				Family workers in Sesame crop				Total workers	
			Male		Female		Male		Female			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1-2	136	58	78	12	64	10	49	08	45	07	236	37
3-4	74	31	90	14	89	14	33	05	35	05	247	39
5-6	16	07	25	04	22	03	18	03	17	03	082	13
7-8	10	04	24	04	12	02	20	03	19	03	075	11
Total	236	100	217	34	187	29	120	19	116	18	640	100

Source: Questionnaire of the research, 2012.

The percent of male workers in Dura crop is 34%, compared to 19% of male workers in Sesame. While, the percent of female workers in Dura crop is 29%, compared to 18% of female workers in Sesame.

It is noted that available family labor, for most of the farming households, is limited to 1 or 2 workers . It indicates that small farmers

could not be able to expand their production with the limited available family labor. In fact, availability of family labor determines the size of farm of the household. If the available family labor is large, then the size of land cultivated by the household is expected to be large and vice versa. This also, indicates that family labor has been fragmented and no longer constitutes unit of production for smallholder farming households. Therefore, smallholder farming households need to be empowered to adopt another alternative to family labor. For example, be empowered to have access in hired labor. It is also noted that most of the family workers devoted their labor to Dura production. This is because Dura is staple food crop in the area, beside, Dura has become one of the main cash crops in the local markets of the area. Therefore, households are devoting most of their family effort on it.

To see whether there is relation between area cultivated by Dura and the distribution of family workers (both male and female), chi-square test is applied as shown in table 4.4.2.1.2.

Table 4.4.2.1.2 Land Cultivated by Dura according to family workers

Cultivated land by Dura in feddans	No. and the % of family workers	Family workers (Dura)						Total
		1-3 worker male	4-6 worker male	7- 9 worker male	1-3 worker female	4-6 worker female	7-9 worker female	
1-4	No.	43	6	19	30	23	0	121
	% of Total	10.6	1.5	4.7	7.4	5.7	.0	30.0
5-9	No.	23	49	31	26	47	0	176
	% of Total	5.7	12.1	7.7	6.4	11.6	.0	43.6
10+	No.	12	35	23	10	26	1	107
	% of Total	3.0	8.7	5.7	2.5	6.4	.2	26.5

Total	**No.**	**78**	**90**	**73**	**66**	**96**	**1**	**404**
	% of Total	**19.3**	**22.3**	**18.1**	**16.3**	**23.8**	**.2**	**100.0**

Source: Own field work of the study, 2012.

	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	**62.083**	**10**	**.000**

The above table test shows that, the total number of family workers(both male and female) in Dura production is 404 workers distributed in the different land size groups of the area cultivated in feddans. In land size group 1-4 feddans, the percent of family workers employed is 30% of the total family workers amounting to 121 workers. In land size group 5-9 feddans, the percent of family workers employed is 43.6% amounting to 176 workers. In land size group 10+ feddans, the percent of family workers employed is 26.5% amounting to 107 workers. So, more family labor is applied to small plots of land.

In land size group 1-4 feddans, the highest percent of family workers employed in Dura production is 10.6% of the male family workers amounting to 43 workers range 1-3 workers, followed by 7.4% of female family workers amounting to 30 workers range 1-3 workers, followed by 5.7% of female family workers amounting to 23 workers range 4-6 workers, followed by 4.7% of male family workers amounting to 19 workers range 7-9 workers, followed by 1.5% of male family workers amounting to 6 workers range 4-6 workers.

In land size group 5-9 feddans, the highest percent of family workers employed in Dura production is 12.1% of the male family workers amounting to 49 workers range 4-6 workers, followed by 11.6% of

female family workers amounting to 49 workers range 4-6 workers, followed by 7.7% of male family workers amounting to 31 workers range 7-9 workers, followed by 6.4% of female family workers amounting to 26 workers range 1-3 workers, followed by 5.7% of male family workers amounting to 6 workers range 1-3 workers.

In land size group 10+ feddans, the highest percent of family workers employed in Dura production is 8.7% of the male family workers amounting to 35 workers range 4-6 workers, followed by 6.4% of female family workers amounting to 26 workers range 4-6 workers, followed by 5.7% of male family workers amounting to 23 workers range 7-9 workers, followed by 3% of male family workers amounting to 12 workers range 1-3 workers, followed by 2.5% of female family workers amounting to 10 workers range 1-3 workers, followed by .2% of female family workers amounting to 1 worker range 7-9.

Accordingly, the chi-square test indicates the significant relation between the distribution of family workers by sex and the area cultivated in land size groups by Dura, because the value of chi-square is 62.083 under degree of freedom 10 and significance level .000 which is less than 0.05

a) Labor production in Dura crop.

Table 4.4.2.1.3 shows labor production in Dura crop.

Table 4.4.2.1.3 Labor production in Dura crop

Land size	Total cultivated land/ feddan	Output/kg	Family labor			Hired labor			Total labor			Average labor production per feddan in kg
			Male	Female	Total family labor/feddan	Male	Female	Total hired/feddan	Male	Female	Total labor/ feddan	
1-4	192	147240	68	53	.6	149	44	1.0	217	97	1.6	468.9
5-9	518	214200	103	73	.3	202	77	.5	305	150	.9	470.8
10+	603	107460	70	37	.2	109	57	.3	179	94	.5	393.6
Total	1313	468900	241	163	.3	460	178	.6	701	341	.8	450

Source: Questionnaire of the study, 2012.

Table 4.4. 2.1.3 shows that both family and hired labor are employed by farmers in Dura production. The number of male family workers employed is 241, compare to 163 female family workers, while the number of male hired workers is 460, compared to178 female hired workers. Total family labor per feddan is .3, total hired labor per feddan is .6, and the total labor is .8. labor productivity is 450 kg.

Its noted from the above 4.4.2.1.3, that hired labor employed in Dura production, exceeds family labor in all land size group. Also, its noted that average labor production per feddan in small holdings (1-9) feddan, is higher than average labor production in large holdings (10+) feddans, 509 SDG compared to 393 SDG. This indicates that family labor is no longer playing the same traditional role as the main source of labor in peasantry farms. This result is crucial, particularly, hired labor is needed in all farm operations, and not in single operation as it was happening before. Consequently, to what extent farmer is able to employ hired labor, will determine the size of land cultivated by him. Of course, ability to employ hired labor, mainly, depends on the access of capital one has. So, financial empowerment is necessary for farmers to purchase farm inputs including hired labor. Also, this table indicates that labor production per feddan in small plots size is efficient than labor production per feddan in large plots size.

b) Labor cost in Dura crop.

Table 4.4.2.1.4 shows cost of labor in Dura crop.

Table 4.3.2.1.4 cost of labor in Dura production..

Farm size	Output in kilos	Family labor cost/SDG						Hired labor cost/SDG						Total cost/SDG	Per unit cost/ SDG
		Total cost			Per unit cost of labor			Total cost			Per unit cost of labor				
		male	female	total	male	female	total	male	female	total	male	female	total		
1-4	147240	3400	2120	5520	50	40	90	7450	1760	9210	50	40	90	14730	47
5-9	214200	5150	2920	8070	49.7	40	89.7	10100	3080	13180	50	40	90	21250	47
10+	107460	3500	1480	4980	50	40	90	5450	2280	7730	50	40	90	12710	47
Total	468900	12050	6520	18570	50	38.3	88.3	23000	7120	30120	50	40	90	48790	47

Source: Own field work of the study, 2012.

Its noted from table 4.4.2.1. 4 that total cost of hired labor in Dura, exceeds total cost of family labor in Dura, in all land size groups, although per unit cost of labor is the same for family and hired labor. This indicates that more hired labor is employed, compared to family labor, by all farmers including small farmers. So, hired labor is becoming inevitable input for farmers in the area. This means farmers could not continue farming process, unless, they are financially empowered to employ hired labor. Also, its noted that male labor cost is higher than the cost of the female. This indicates people differentiate between male workers and female workers in terms of effort they produce. To compare, per unit cost of labor in Dura production which is 47 SDG, with 64 SDG for unit cost of labor in Sesame crop production in table 4.2., we see that cost of labor in Dura production is less, and with net difference amounting to 17 SDG. Cost of labor for Sesame is always higher than the cost in Dura because harvesting period for Sesame is limited; if a farmer fails to catch it, then the whole season of Sesame will be spoiled. Therefore, farmers try to offer high wages to attract hired labors

Table 4.4.2.1. 5 shows that, the total number of family workers (both male and female) in Sesame production is 236 workers distributed in the different land size groups of the area cultivated in feddans . In land size group 1-4 feddans, the percent of family workers employed is 63.1% of the total family workers amounting to 149 workers. In land size group 5-9 feddans, the percent of family workers employed is 26.7% amounting to 63 workers. In land size group 10+ feddans, the percent of family workers employed is 10.2% amounting to 24 workers. So, small famers devote more of their family labor to production of Sesame in small plots.

Table 4.4.2.1. 5 Land cultivated by Sesame according to Family labor

Cultivated land by Sesame in feddan	No. and %of family workers	Family workers in Sesame crop					Total
		1-3 Male worker	4-6 Male worker	7-9 Male worker	1-3 Female worker	4-6 Female worker	
1-4	No.	46	20	10	36	34	149
	%	19.5	8.5	4.2	15.3	14.4	63.1
5-9	No.	4	11	22	4	18	63
	%	1.7	4.7	9.3	1.7	7.6	26.6
10+	No.	1	2	11	6	4	24
	%	.4	.8	4.7	2.5	1.7	10.2
Total	No.	51	33	43	46	56	236
	%	21.6	14	18.2	19.5	23.7	100.0

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	**60.130**	**10**	**.000**

Source: Questionnaire of the study, 2012.

In land size group 1-4 feddans, the highest percent of family workers employed in Sesame production is 19.5% of the male family workers amounting to 46 workers range 1-3 workers, followed by 15.3% of female family workers amounting to 36workers range 1-3 workers, followed by 14.4% of female family workers amounting to 34 workers range 4-6 workers, followed by 8.5% of male family workers amounting to 20 workers range 4-6 workers, followed by 4.% of male family workers amounting to 10 workers range 7-9 workers.

In land size group 5-9 feddans, the highest percent of family workers employed in Sesame production is 9.3% of the male family workers amounting to 22 workers range 7-9 workers, followed by 7.6% of female family workers amounting to 18 workers range 4-6 workers, followed by 4.7% of male family workers amounting to 11workers range 4-6 workers, followed by 1.7% of male family workers amounting to 4workers range 1-3 workers, and 1.7% of female family workers amounting to 4 workers range 1-3 workers.

In land size group 10+ feddans, the highest percent of family workers employed in Sesame production is 4.7% of the male family workers amounting to 11 workers range 7-9 workers, followed by 2.5% of female family workers amounting to 6 workers range 1-3 workers, followed by 1.7% of female family workers amounting to 4 workers range 4-6 workers, followed by .8% of male family workers amounting to 2 workers range 4-6 workers, followed by .4% of male family workers

amounting to 1worker range 1-3 workers.

Accordingly, the chi-square test indicates the relation between the distribution of family workers by sex and the area cultivated in land size groups by Sesame is statistically significant, because the value of chi-square is 60.130 under degree of freedom 10 and significance level .000, which is less than 0.05, as shown in table.

The percent of smallholder farming households who see family labor in Dura crop not enough is 71%, compared to 29% for those who see otherwise. While, the percent of smallholder farming households who see family in Sesame crop not enough is the same as that of those who see family labor is enough in Sesame and the percent each is 50% . Table 4.4.3..6 Describes sufficiency of family labor in Dura and Sesame production, the main two crops cultivated in the area:

Table 4.4.2.1. 6 Sufficiency of family labor in Dura and Sesame production:

Main crop	Enough		Not enough		Total	
	No. of farmers	%	No. of farmers	%	No. of farmers	%
Dura	44	29	106	71	150	64
Sesame	43	50	43	50	86	36
Total					236	100.0

Source: Questionnaire of the study,2012.

Table 4.4.2.1.6 indicates that, family labor is not sufficient to carry out all agricultural operations needed in Dura crop production. For Sesame crop, half of farmers see family labor sufficient and the other half sees otherwise. This indicates that hired labor is becoming inevitable input. Without access of capital farmers can be able to employ hired labor.

Therefore, farmers particularly small farmers are in dare need to financial empowerment

4.4.2.2 Hired Labor:

Hired labor is the second type of labor organization. Historically it was confined to certain agricultural operations during peak periods for instance weeding. Today, hired labor is becoming in important in every single farm operations of all farmers, whether they are small farmers or large farmers. In addition to this, hired labor is required in all crop production, particularly, Dura and Sesame.

a) Dura production

Generally, the percent of hired male workers in Dura crop is 55%, compared to 45% for female workers hired in the same crop. 30% of households hired number of male workers range between 1 to 3 workers per household. 15% of households hired number of male workers range between 4 to 6 workers per household. 6% of households hired number of male workers range between 7 to 9 workers per households. While, for hired female workers the percent of households hired number of female workers range between 1 to 3 workers per household is 37%. 10% of households hired number of female workers range between 4 to 6 workers per household. 2% of households hired number of female workers range between 7 to 9 workers per household. Table 4.4.2.2.1 shows distribution of hired workers in Dura crop by sex.

Table 4.4.2. 2.1 Distribution of Hired Workers in Dura Crop by Sex.

Group of hired workers	Households who hired male workers	Households who hired female workers	Hired male workers	Hired female workers	Total hired workers

	No.	%	No.	%	No.	% of total hired	No	% of total hired	No	%
1-3	62	30	75	37	127	20	162	25	289	45
4-6	31	15	20	10	136	21	93	10	229	36
7-9	12	06	04	02	87	14	33	05	120	19
Total	105	51	99	49	350	55	288	45	638	100

Source: Questionnaire of the study, 2012

So, the above table indicates that for Dura crop production, hired labor has become a necessity to smallholder farming household in the area not in a single operation but in all agricultural operations. Any farmer, with family labor alone, will not be able to continue farming Dura the main subsistence crop, efficiently, unless, he introduces hired labor in all operations of his farm. Therefore, financial empowerment is critical to small farmers to maintain their efficiency and achieve further levels in Dura production. Also, this table indicates that farmers prefer male hired workers than female hired workers to be hired in their farms, that is because male workers have are physically strong than females workers. In addition to this, in far farms usually farmers stay for days with their labors, far from the villages, to continue work, which female workers cannot do.

For the purpose of testing whether there is relation between area cultivated by Dura in size group feddans and the distribution of the hired workers (both male and female), chi-square test is carried out as is shown below:

Table 4.4.2.2.2 Land Cultivated by Dura according to Hired workers.

Cultivated land by	**No. and the %of**	**Hired workers in Dura crop**					**Total**
		1-3	**4-6**	**7- 9**	**1-3**	**4-6**	

Dura in feddans	the hired workers	worker male	worker male	worker male	worker female	worker female	
1-4	No.	91	50	8	16	28	193
	% of Total	14.3	7.8	1.3	2.5	4.4	30.3
5-9	No.	131	58	13	21	56	279
	% of Total	20.5	9.1	2.0	3.3	8.8	43.7
10+	No.	69	25	15	13	44	166
	% of Total	10.8	3.9	2.4	2.0	6.9	26.0
Total	No.	291	133	36	50	128	638
	% of Total	45.6	20.8	5.6	7.8	20.1	100.0

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.964	8	.030

From the above table it is noted that, in land size group 1-4 feddans the percent of total workers employed in Dura farm is 30.3% amounting to 193 workers. In land size group 5-9 feddans , the percent of total hired workers employed is 43.7% amounting to 270 workers. In land size group 10+ feddans, the percent of the total hired workers employed is 26% amounting to 166 workers. The percent of the total hired workers in Dura crop, is 100% amounting to 638 workers.

In the land size group 1-4 feddans, the highest percent of the total hired workers employed is 14.3% of male workers amounting to 91 workers range 1-3 workers, followed by 7.8% of total males workers amounting to 50 workers range 4-6 workers, followed by 4.4% of the total hired

female workers amounting to 28 workers range 4-6 workers, followed by 2.5% of the total female workers amounting to 16 workers range 1-3 workers, and followed by 1.3% of the total male hired workers amounting to 8 workers range 1-3 workers.

In the land size group5-9 feddans, the highest percent of the total hired workers employed is 20.5% of male workers amounting to 131 workers range 1-3 workers, followed by 9.1% of total males workers amounting to 58 workers range 4-6 workers, followed by8.8% of the total hired female workers amounting to 56 workers range 4-6 workers, followed by 3.3% of the total hired female workers amounting to 21 workers range 1-3 workers, and followed by 2% of the total male hired workers amounting to 13 workers range 1-3 workers.

In the land size group10+ feddans, the highest percent of the total hired workers employed is 10.8% of male workers amounting to 69 workers range 1-3 workers, followed by 6.9% of total females workers amounting to 44 workers range 4-6 workers, followed by 3.9% of the total hired male workers amounting to 25 workers range 4-6 workers, followed by 2.4% of the total hired female workers amounting to 15 workers range 7-9 workers, and followed by 2% of the total female hired workers amounting to 13 workers range 1-3 workers.

This chi-square test indicates the significance of relation between the distribution of hired workers by sex and the area cultivated by Dura crop, because chi-square is 16.964 under degree of freedom 8 and significance level .03 which is less than .o5.

b)Sesame production .

Generally, the percent of hired male workers in Sesame crop is 64% amounting to 136 workers, compared to 36% amounting to 91 workers for female workers hired in the same crop. 27% of households amounting to 20 households, hired number of male workers range

between 1 to 3 workers per household. 14% of households amounting to 10 households, hired number of male workers range between 4 to 6 workers per household. 14% of households amounting to 10 households, hired number of male workers range between 7to 9 workers per households. While, for hired female workers the percent of households hired number of female workers range between 1 to 3 workers per household is 40% amounting to 29 households. 5% of households amounting to 4 households, hired number of female workers range between 4 to 6 workers per household. None of the households hired number of female workers range between 7 to 9 workers. Table below **4.4.2.2 2** shows distribution of hired workers in Sesame crop by sex:

Table 4.4.2.2. 2 Distribution of hired workers in Sesame crop by sex.

Group of hired workers	Households who hired male workers		Households who hired female workers		Hired male workers		Hired female workers		Total hired workers	
	No.	% of the total	No.	% of the total	No.	% of total hired workers	No.	% of total hired worker	No.	%
1-3	20	27	29	40	44	17	71	28	115	45
4-6	10	14	04	05	45	18	20	08	65	26
7-9	10	14	00	00	74	29	00	00	74	29
Total	40	55	33	45	163	64	91	36	254	100

Source: Questionnaire of the study, 2012

This table indicates that for Sesame crop, hired labor has become a necessity to most smallholder farming households in the area. Most of the farmers, with their family labor alone, will not be able to continue

farming efficiently, unless, they employ hired labor in their farm. Therefore, financial empowerment is critical to small farmers to maintain efficiency in agricultural production. Also, this table indicates that farmers don't differentiate between male and female labor to be hired in their farms for Sesame production.

For further test, chi-square is carried out to see significance of the relation between the cultivated land and the distribution of hired workers (male and female) in Sesame crop as shown below:

Table 4.4.2. 2.3 Land Cultivated by Sesame and Hired workers

Land cultivated by Sesame in feddans	No. and the %of hired workers	Hired workers in Sesame crop					Total
		1-3 worker male	4-6 worker male	7- 9 worker male	1-3 worker female	4-6 worker female	
1-4	No.	59	24	10	58	16	167
	% of Total	23.2	9.4	3.9	22.8	6.3	65.7
5-9	No.	12	13	6	27	5	63
	% of Total	4.7	5.1	2.4	10.6	2.0	24.8
10+	No.	5	6	2	8	3	24
	% of Total	2.0	2.4	.8	3.1	1.2	9.4
Total	No.	76	43	18	93	24	254
	% of Total	29.9	16.9	7.1	36.6	9.4	100.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.024	8	.03

From the above table, it is shown that in land size group 1-4 feddans the percent of the total hired labor (male and female) employed in Sesame crop is 65.2% amounting to 167 workers. In the land size group 5-9 feddans, the percent of total hired labor employed is24.8% amounting to 63 workers. In land size group 10+, the percent of total hired labor employed is 9.4% amounting to 24 workers.

In land size group1-4 feddans the highest percent of hired labor employed is 23.2% of male workers amounting to 59 workers range between 1-3 male workers, followed by 22.8% of female workers amounting to 58 female workers range also between 1-3 female workers, followed by 9.5% of male workers amounting to 24 male workers range between 4-6 male workers, followed by 6.3% female workers amounting to 16 female workers in the same of workers. This followed by 3.9% of male workers amounting to 10 male workers range between 7-9 male workers.

In land size group 5-9 feddans, the highest percent of hired workers employed in Sesame crop is 10.6% of female hired workers amounting to 27 female workers range between 1-3 workers, followed by 5.1% of the male hired workers amounting to 13 male workers in the range 4-6 workers, followed by 4.7% of male hired workers amounting to 12 male workers range between 1-3 workers, and followed by 2% of the female hired workers amounting to 5 female workers in range 4-6 workers.

In land size group 10+, the highest percent of hired workers in Sesame crop is 3.1% of female hired workers amounting to 8 female workers

range 1-3 workers, followed by 2.4% of male hired workers amounting to 6 male workers range4-6 workers, followed by 2% of male workers amounting to 5 male workers range 1-3 workers, followed by 1.2% of hired female workers amounting to 3 female workers range 4-6 workers.

The chi-square test indicates that there is no significant relation between the distribution of hired workers by sex and the cultivated area by Sesame crop, because chi-square is 9.024 under degree of freedom 8 and the significance level is .03 which is greater than .05. Sometimes farmers, particularly large farmers, apply tractor in two main farm operations of Sesame; first ploughing of the land and cropping seeds.

4.4.2.3 'Nafeer' labor.

'Nafeer' labor is third type of labor organization. It is a reciprocal help of the community individuals to each other particularly during peak periods. The only cost incurred, is the food and drinks that is offered to the 'Nafeer' members. Today, the importance of 'Nafeer' is declining, and the reason is that cost of the things offered to the 'Nafeer' members is increasing compared to the value of the task that could be done by the 'Nafeer'.

20% of the total households amounting to 48 households made non of' 'Nafeer' labor. 23% of the total households amounting to 54 households made the' Nafeer' labor once. 48% of the total households amounting to 113 households made the' Nafeer' labor twice. 9% of the total households amounting 21 households made the 'Nafeer' triple times. Table 4.4.2.3.1 below shows the status of 'Nafeer'

Table 4.4.2.3.1 Status of' 'Nafeer' as one of the traditional forms of labor.

% of households	No. of households	No. of" Nafeer"

20	**48**	**0**
23	**54**	**1**
48	**113**	**2**
09	**21**	**3**
100.0	**236**	**Total**

Source: Questionnaire of the study, 2012.

This table indicates that' Nafeer' labor as one of the three main forms of labor available in the area, is not feasible form of labor to farmers. It is not frequent in households farms. The only explanation of this retreat is the cost of food materials and drinks has increased and they couldn't provide the necessary cost, and this indicates in return that small farmers are not in good economic conditions.

4.4.3 Credit markets.

Credit market provides the necessary capital for farm investment. Therefore, this market is worth treatment by the study to determine sources of credit, scope of loaning, access of local farmers to credit. Beside, looking to the relation between access of credit and land ownership.

Table 4.4.3.1 below shows the distribution of loans and the status of debts by credit institutions. The total number of households credited from different credit institutions amounts 53 households with total loan size 62207 SDG and total debt 24580 SDG which is unpaid loan. 38% of households amounting to 20 households, received credit from Agric-bank with average loan size 689 SDG and average debt incurred 376 SDG . 2% of the households amounting 1 household, received from government with average loan size 500 SDG. 43% of the households amounting 23 households, received credit from NGOs with average loan size 1927 SDG and average debt 722 SDG. 17% of the households

amounting to 9 households, received credit from 'Shayel' system with average loan size 1193 SDG and average debt 52 SDG.

Table 4.4.3.1 Distribution of loan size by credit institutions.

Institution	Households		Loan		Debt		Average loan (SDG)	Average debt (SDG)
	No.	%of the total	(SDG)	%	(SDG)	%		
Agric-bank	20	38	13782	22	7510	31	689	376
Government	01	02	500	01	00	00	500	00
NGOs	23	43	44315	71	16605	67	1927	722
Shayel" "	09	17	3610	06	465	02	401	52
Total	53	100	62207	100.	24580	100.	1173	464

Source: Own field work of the study, 2012.

It is noted from the table that the available credit institutions are very limited number wise. Only four credit sources are available, in an area of mass and dispersed producers. Is not feasible to have limited credit sources which located in big cities and towns to provide credit facilities to farmers who are actually in remote rural areas. They should be widely dispersed across the whole area even the remote rural areas. The second thing is that NGOs is the most active credit institution compared to other institutions, because NGOs credits to households amounted to 71% of the total loan. But the problem of NGOs is that, their work is not for sustainable development, it is for emergency services. It is noted also, that' Shayel' system, though it is informal credit institution, is functioning among the small farming households and its contribution is

even more than government funding farmers.

So, this table indicates that small farmers in the Nuba Mountains have no access to credit facilities from official credit institutions. Therefore, some farmers try to compensate the absence of official credit by seeking credit from informal credit institutions such as 'Shayel' system.

For further test to see the significance of the relation between the type of land ownership and the access small farmers to credit facilities from credit institutions, chi-square test is carried out as is shown below:

Test of credit loan institutions by land ownership.

Table 4.4.3.2 Credit source by land tenure.

Total	Land tenure		No. and the %	Institution
	Rent	Private ownership		
20	5	15	No.	Agric-bank
37.7	9.4	28.3	% of Total	
1	0	1	No.	Government
1.9	.0	1.9	% of Total	
23	0	23	No.	NGOs
43.4	.0	43.4	% of Total	
9	0	9	No.	'Shayel" system
17.0	.0	17.0	% of Total	
53	5	48	No.	Total
100.0%	9.4%	90.6%	% of Total	

Chi-Square Tests

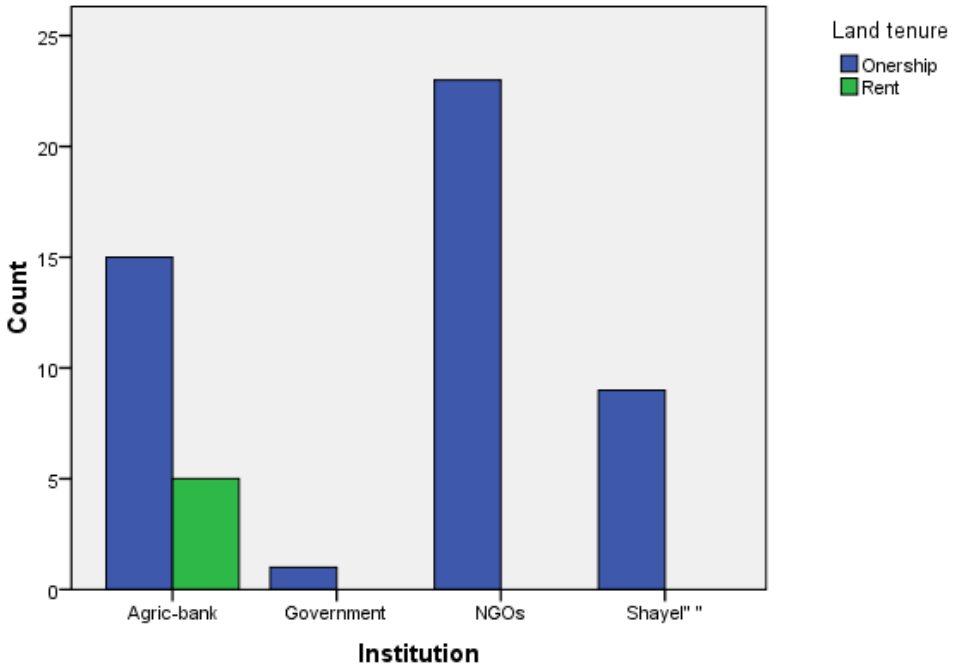
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.109	3	.028

From the above cross tabulation test, it is noted that the percent of farmers who privately own the land and received credit from the Agric-bank, is 28.3% amounting to 15 farmers, compared to 9.4% amounting to 5 farmers for farmers who rented the land and received the credit from the same bank. In government as credit institution, is 1.9% amounting to only one farmer who is private land owner. In NGOs, the percent of farmers who received credit and privately own the land is 43.4% amounting to 23 farmers, compared to non of farmers rented the land. In 'Shayel' system the informal credit institution, the percent of farmers who received credit and privately own the land is 17% amounting to 9 farmers, compared to non of farmers rented the land.

This test indicates to existence of relationship between the type of land ownership and the access of farmers to credit loans from different credit institutions. Private ownership of land differentiates, in credit acquisition, from other type of land ownership, because chi-square is 9.100 under degree of freedom 3 and significance level .028 which less than .05.

Figure(1) below illustrates the relation between types of land ownership and the size of credit from credit institutions:

Figure(1) Distribution of credit by source.



So, figure (1) illustrates the relation between the types of land ownership and the size of loan from credit institutions.

Table 4.4.3.3 Source of credit by Date of selling

Total	Date of selling				Source of credit
	End of harvest	During harvest	Beginning of harvest		
20	10	0	10	No.	Agric-bank
38	19	0	19	% of Total	
1	0	1	0	No.	Government
2	0	2	0	% of Total	
23	0	19	4	No.	NGOs
43	0	36	7	% of Total	
9	5	0	4	No.	Shayel" "

17	9	0	8	% of Total	
53	15	20	18	No.	Total
100.0	28	38	34	% of Total	

Source: Questionnaire of the field study, 2012.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	55.919	6	.000

So, 38% of the total households amounting to 20 households of those received credit from different credit sources, sell their crop during harvest, followed by 34% of the total households amounting to 18 households sell at the beginning of harvest, followed by 28% of the total households amounting to 15 households received credit from different credit sources sell their crops at the end of harvest.

If we read table 4.4.3.2 With this table 4.4.3.3 , we can note that in table 4.4.1 most of the producers sell their crops at the end of the harvest i.e. they try to reach the rise of crop prices when the stock run short in the market . While, in table 4.4.3 above, we note that most of the producers sell their crops during and at the beginning of harvest i.e. they sell at low prices. This indicates, that loan repayment obliged farming households to sell their crops at low prices at the beginning and during harvest time. This requires arrangements regulations with credit source authorities to extend the date of loan repayment till the end of the season. This will

enable farmers increase incomes because they can wait and sell their crops at higher prices and repay loans without difficulties .

For further test of the relation between selling date and credit sources, chi-square test is carried out, and the test as is shown above is significant because the value of chi-square 55.919 at degree of freedom 6 and significant level .000, which is less than0.05.

So, and in the absence of enough credit institutions in the area and the low farm revenues, small farmers meet the demand for cash for social obligations by liquidating some of their owned of assets as shown in the table 4.4.3.4.

Table 4.4.3.4 Properties sold by small holder household under pressure and the purpose.

Purpose for selling the property										Property
Consumption		Social occasions		Debt payment		Medicine		Education		
%of total	households	%of total	households	%of total	households	%of total	households	%of total	households	
01	02	0.4	01	00	00	1.3	03	.4	01	Beds
02	04	0.4	01	1.3	03	05	11	02	04	Utensils
1.3	03	01	02	01	02	02	04	1.3	03	Chairs
00	00	00	00	00	00	00	00	1.3	03	Tables
0.4	01	00	00	00	00	00	00	00	00	Sheep
8.3	18	5.4	12	11.2	26	4.7	09	15	36	Cows
09	21	7.4	17	7.2	17	13	30	17	40	Goats
22	54	20.4	48	12.3	29	15	35	21	49	Donkeys

44	**103**	**34**	**81**	**33**	**77**	**39**	**92**	**58**	**136**	**Total**

Source: Questionnaire of the study,2012.

Table 4.4.3.4 Shows properties sold by smallholder farming households under pressure and the purpose of selling property. The percent of households sold different properties for the purpose of education, is 58% of the total households amounting to 136 households. 39% of the total households amounting to 92 households, sold their properties for the purpose of medicine. 33% amounting to 77 households, for the purpose of debt payments. 34% amounting to 81 households for the purpose of social occasions.44% of the total households amounting to 103 households, sold properties for consumption purposes. The percents of households sold properties for the purpose of education, are: 4% amounting to one households, sold beds, 2% amounting to 4 households, sold Utensils , 1.3% amounting to 3 households, sold Chairs, 1.3% amounting to 3 households, sold Tables , 15% amounting to 36 households, sold Cows , 17% amounting to 40 households sold Goats, and 21% amounting to 49 households sold Donkeys. For the purpose of the medicine, the percents of households sold properties are: 1.3% amounting to 3 households sold Beds, 5% amounting to 11 households sold Utensils, 2% amounting to 4 households sold Chairs, 4.7% amounting to 9 households sold Cows, 13% amounting to 30 households sold Goats, 15% amounting to 35 households sold Donkeys. The percents of the households sold properties for the purpose of debt payments are: 1.3% amounting to 3 households sold Utensils, 1% amounting to 2 households sold Chairs, 11.2% amounting to 26 households sold Cows, 7.2% amounting to17 households sold Goats, and 12.3% amounting to 29 households sold Donkeys. The percent of the households who sold their properties for the purpose of social occasions are: .4% amounting to one household sold Beds, .4% amounting to one household sold Utensils, 1% amounting to 2 households sold Chairs, 5.4% amounting to 12 households sold Cows, 7.4% amounting to 17 households sold Goats, and 20.4% amounting to 48 households sold Donkeys. The percent of the households who sold properties for consumption purposes are: 1%

amounting to 2 households sold Beds, 2% amounting 4 households sold Utensils, 1.3% amounting to 3 households sold Chairs, .4% amounting to one households sold Sheep, 8.3% amounting to 18 households sold Cows, 9% amounting to 21 households sold Goats, and 22% amounting to 54 households sold Donkeys.

This table indicates that, small farmers are under economic pressure. They have sold properties to meet household's requirements. These requirements include consumption and some other necessary elements such as education, debt repayment, and health care. So, selling properties under economic pressure to meet these requirements is not a positive solution of the problem. That is because, it erode the economic capacity of the small farmers instead of building small farmer's capacity which is eroding already.

4.5 Agricultural wages:

Agricultural wages are importance because they determine the income of those who are envolve in it. Ofcourse males and females are both engaging in agriculture as workers how wages are distributed among them? Are wages the same for males and females? What are the defferential of wage in Dura crop and that of Sesame?

a) Distribution of wages by sex in Dura and Sesame crops.

Table 4.5 below shows the distribution of agricultural wages by sex in crop of Dura and Sesame. 4% of tatal male workers in Dura crop amounting to13 male workers recieved wage less 50 SDG compared to 11% of the total female workers in Dura crop amounting to 37 female workers receiving the same wage level. Whie, in sesame crop, 1% of the total male workers amounting 2 male workers were paid wages less than50 SDG compared to 6% of the total female workers in sesame crop, amounting to 20 feamale workers receiving the same wage level. 15% of the total male workers in Dura crop amounting to 50 male workers

received wage level 50-99 SDG compared to 9% of the total female workers in Dura crop amounting to 27 female workers receiving the same wage level. In sesame crop, 6% of the total male workers amounting to 20 male workers, received wage level 50-99 SDG compared to 5% of the total female workers in the same crop, amounting to 18 workers receiving the same level of wage. 4% of the total male workers in Dura crop amounting to 15 male workers received wage level 100-149 SDG compar4ed to 10% of the total female workers in same crop amounting to 35 female workers receiving the same wage level. In sesame crop, 4% of the total male workers amounting to 14 male workers received wage level 100-149 SDG compared to 2% of the total female workers in the same crop, amounting to 8 female workers receiving the same wage level. 9% of the total male workers in Dura crop, amounting to 30 male workers received wage level 150-199 SDG compared to 1% of the toal female workers in the same crop amounting to 4 female workers receiving the same wage level. In the sesame crop, 4% of the total male workers amounting to 13 male workers received wage level 150-199 SDG compared to 1% of the total female workers amounting to 3 female workers receiving the same wage level. 4% of the total male workers in Dura amounting to 13 male workers received wage level 200+ SDG compared to 1% of the total female workers in the same crop amounting to 4 female workers receiving the same wage level. In sesame crop, 2% of the total male workers amounting to 8 male workers received wage level 200+ compared to 1% of the total female workers in the same crop amounting to 3 female workers receiving the same wage level.

Table 4.5.1 Distribution of agricultural wages (Dura and sesame crops) by sex.

Total	Sesame	Dura	Payment/operation

		Female		Male		Female		Male		
%	No.	%	No.	%	No.	%	No.	%	No.	
22	72	6	20	1	02	11	37	4	13	< 50 SDG
35	115	5	18	6	20	9	27	15	50	050 -99
20	72	2	08	4	14	10	35	4	15	100 -149
15	49	1	03	4	13	1	03	9	30	150 -199
08	28	1	03	2	08	1	04	4	13	200 +
100	336	15	52	17	57	32	106	36	121	Total

Source: Questionnaire of the study, 2012.

*** wages represent cost of operation**s needed.

This indicates that, in both crops the response of female workers to low wages is higher than male workers, Male workers response more to high wages. Also, this table indicates that Dura production absorbs more hired labor compared to sesame, so Dura production is source of agricultural wages. It's noted in Dura, that the number of male workers exceeds the number of female workers, while in Sesame crop the number of female workers exceeds the number of male workers. This explains that males prefer long term work in Dura than working in Sesame which needs short term be harvested.

Figure (2) Wage distribution in Dura crop by sex.

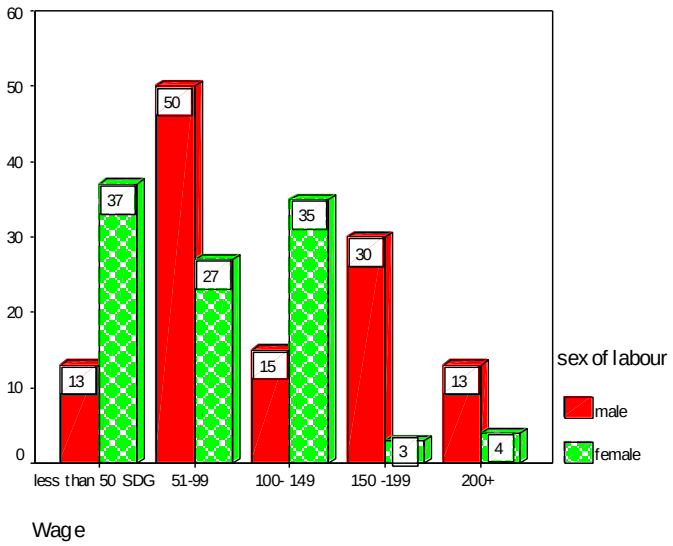
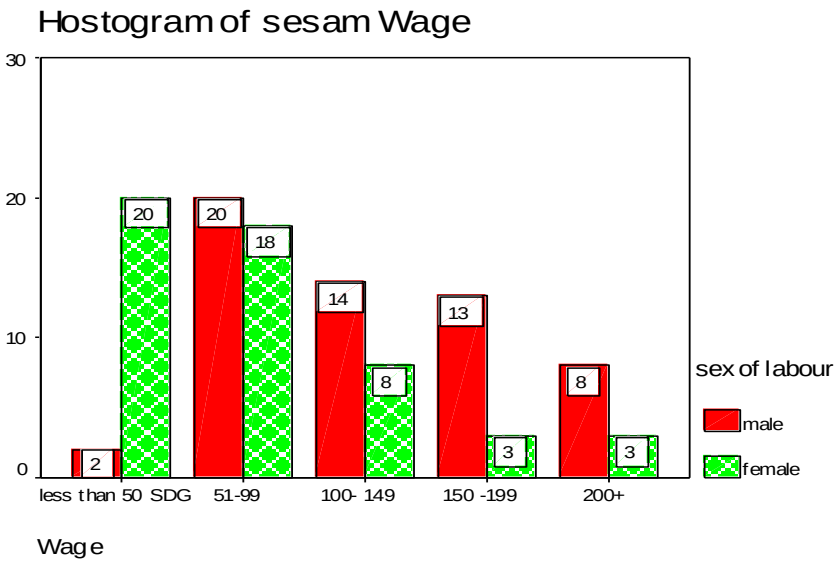


Figure (3) wage distribution of Sesame by sex.



b) Hired out labor.

Some households members sell their labor out to others. How much income they can add to the household income? What is the wage differential between males and females, who hired out labor? And how it affect family labor?

Hired out family labor by crop.

Table 4.5.2 shows that 169 male hired out family workers are employed in Dura crop, compared to 224 female hired out family workers in the

same crop, while 39 male hired out family employed in Sesame crop, compared to 27 female hired out family workers. Also, the table shows that average payment for hired out family worker in Dura is 95.1 SDG, for Sesame is 132.4 SDG, and the total average payment for hired out family workers is 224.5 SDG.

Table 4.5.2 Hired out family labor.

Average wage per worker		Payment of family labor hired out in SDG			Total family labor hired out			Crop
female	Male	Total payment	Female payment	Male payment	Total	Female	Male	
76.2	120.3	37384	17059	20325	393	224	169	Dura
92.2	160.3	8740	2490	6250	66	27	39	Sesame
78.0	128.0	46124	19549	26575	459	251	208	Total

Source: Questionnaire of the study, 2012.

Its noted from the above table that female family labor hired out exceeds male family labor hired out. Its noted also, that most of family labor hired out is employed in Dura production. Although female family labor hired out exceeds the number of male family labor hired out, payment of male labor hired out exceeds the payment of female family labor hired out. This indicates that payment of female is less than that of the male as is shown in table 4. 5.2 above. Despite the weak payment of hired out family labor, hired out family labor remains a source of off-farm incomes of the households. On the other hand, hired out family labor influenced adversely family labor as unit of production in households farms.

4.6 Productivity and cost of production:

a) production of labor in Sesame

Table 4.6.1Illustrates labor productivity in Sesame crop.

Table 4. 6.1 labor production in Sesame crop.

Land size	Total cultivated land /feddan	Output/kg	Family labor			Hired labor			Total labor			Average labor production/kg
			Male	Female	Total family labor/ feddan	Male	Female	Total hired/ feddan	Male	Female	Total labor/ feddan	
1-4	175	52725	76	70	.8	93	74	1.0	169	144	1.8	168.5
5-9	227	27225	37	22	.3	31	32	.3	68	54	.5	223.2
10+	145	14400	14	10	.2	13	11	.2	27	25	.4	277
Total	547	94350	127	102	.4	137	117	.6	264	223	.9	193.7

Source: Questionnaire of the study, 2012

Its noted from the above table, that hired labor employed in Sesame production, exceeds family labor in all land size group. Also, its noted that average labor production per feddan in small holdings (1-9) feddans, is more than average labor production in large holdings (10+) feddans, 391.7 kg compared to 277 kg.

This table indicates that family labor is not basic in Sesame production as before when family labor was the main source of labor in households farms. This result is crucial, particularly, hired labor is needed in all farm operations, and not in certain operation as it was happening before. Consequently, ability to employ hired labor determines the size of land cultivated by the farmer. And of course, ability to employ hired labor depend on the access of capital. So, financial empowerment to is necessary for farmers to purchase farm inputs including hired labor. Also, this table indicates that labor production per feddan in small plots size is less in efficient than labor production per feddan in large plots size which is more efficient.

b) Cost of labor in Sesame.

Table 4.6.2 shows cost of labor production in Sesame crop

Table 4.6.2 Cost of labor in Sesame production:

Farm size	Output in kilos	Family labor cost/SDG						Hired labor cost/SDG						Total cost/ SDG	Per unit cost/ SDG
		Total cost			Per unit cost of labor			Total cost			Per unit cost of labor				
		male	female	total	male	female	total	male	female	total	male	female	total		
1-4	52725	3800	2450	6250	50	35	85	8450	5040	13490	50	35	85	19740	63.1
5-9	27225	1850	770	2620	50	35	85	3400	1890	5290	50	35	85	8010	65.6
10+	14400	700	350	1050	50	35	85	1350	875	2225	50	35	85	3275	68.2
Total	94350	6350	3570	9920	50	35	85	13200	7805	21005	52	31	83	30925	64.0

Source: Questionnaire of the study, 2012.

* This based on hired – labor const, so it describes the opportunity cost of family labor.

Its noted from the above table that total cost of hired labor in Sesame, exceeds total cost of family labor, in all land size groups, although per unit cost of labor is the same, applying the shadow price used for hired labor, for family and hired labor. This indicates that more hired labor is employed, compared to family labor, by all farmers including small farmers. So, hired labor is becoming inevitable input for farmers in the area. This means farmers could not continue farming process, unless, they are financially empowered to employ hired labor.

Also, its noted that male labor cost is higher than the cost of the female. The differentiation in cost of labor between male and female based on the size of effort they produce. Physically female, always produce less effort compared to male. To compare, per unit cost of labor in Dura production which is 47 SDG, with 64 SDG for unit cost of labor in Sesame crop production in table 4.6.2 we see that cost of labor in Dura production is less and with net difference amounting to 17 SDG. Cost of labor for Sesame is always higher than the cost in Dura, because harvest time for Sesame is limited, if a farmer fail to catch it, then the whole season of Sesame will spoiled. Therefore, farmers try to offer high wages to attract hired labors.

4.7 Crop marketing.

Generally, the percent of Dura producers who sell the crop is 91.4% , compared to 100% for Sesame producers who sell their crop. For Dura crop, 2% of the farmers sell the crop at the beginning of the harvest, 16% during harvest, and 60% at end the of the harvest. While for Sesame, 70% of farmers sell the crop at the beginning of harvest, 9% during harvest, and 36% at the end of harvest. Table 4.7.1 below shows dates of marketing crops for farming households:

Table 4.7. 1 Date of selling crops by smallholder farming households.

Crop	Beginning of harvest		During harvest		End of harvest		Total households		
	households	%	households	%	households	%	producers	Sellers	%
Dura	04	02	37	16	141	60	199	182	91.4
Sesame	16	07	22	9	84	36	122	122	100

Source: Questionnaire of the study, 2012

This table indicates that most of the farmers who produced Dura take part of it to the market. Most of Dura sellers, sell at the end of the harvest. That is because Dura production is mainly for subsistence and farmers tend to keep it as long as possible and sell it only under acute economic pressure. For Sesame marketing, most of producers sell it at the beginning of the harvest to meet their cash obligations, particularly, the Shayle or loans from the banks. So, these cash obligations push some farmers behave uneconomically when marketing their crops. They sell crops at low prices in the beginning and during harvest time when the stock of Dura available in the market. Also, this table indicates that farmers can augment their revenues, if they could wait tell the stock of crops run short in the market and the prices go up. But often, they couldn't wait, and this why they remain vulnerable all the time.

4.8 Farm production and food poverty.

Farm production of the farmers together with their food status, will remain indication of their economic situation. In the previous tables we came across table that shows households' production of Dura, which represent stable food crop in the area. World Health Organization (WHO) has determined, required grain of Dura per person per day as 200g, which is ample to give 2500- 3000 kilocalories necessary for healthy body. According to this, the required quantity for consumption is calculated.

Table 4.8.1show farm production and food status of farmers. It illustrates that the total quantity of Dura produced by households is 468900 kg, total quantity of Dura required by farmers and their family members for consumption is123480 kg, and the total quantity sold is 112884 kg.

Table 4.8.1Farm production of Dura and food poverty.

Size of land/feddan	No. of HHs	HHs members	Quantity produced/kg	Quantity required for HHs consumption/kg	Surplus food/kg	% of food required	HHs whose production is below required food		
1-4	**70**	**384**	**147240**	**32688**	**114552**	**75**	**15**	**90**	**6.4**
5-9	**60**	**346**	**214200**	**29232**	**184968**	**86**	**20**	**126**	**8.5**
10+	**106**	**749**	**107460**	**61560**	**45900**	**43**	**31**	**180**	**13.1**
total	**236**	**1479**	**468900**	**123480**	**345420**	**74**	**66**	**386**	**28.0**

Source: Questionnaire of the study,2012.

Also, this table shows that, Dura has become market crop and not only for subsistence of small farmers as before. It is noted that Farmers, in all land size groups, are taking part of Dura produce to market. On gross level, households do not suffer any food problem. On the contrary, there is food surplus amounting to 345420 kg. While, on the micro level some households are facing food shortages. In land size group(1-4) feddans, 15 households with 90 members and constituting 6.4% of the total households, produce only 5040 kg, which is less than the quantity required for consumption. In land size group (5-9) feddans, 20 households with126 members and constituting 8.5%, produce only 7920 kg, which less than the quantity required for consumption. In land size group(10+) feddans, 31 households with 180 members and constituting 13.1%, produce only11520 kg, which also less than the quantity required for consumption. So, the total percent of households facing food shortages is 28% of the total households. This, indicates that food poverty is spread among households, particularly, among those who cultivate 10+ feddans who are less efficient in production compared to those who cultivate (1-4) feddans and(5-9) feddans.

4.8 Findings of the quantitative data analysis:

Based on the discussions of the quantitative data analysis and the derived indicators, the study reaches findings which support the hypotheses of the study as follows:

- Despite improvements in educational opportunities, still some of school age households members are not attending schools, and still there is seriously high widespread illiteracy among old age group, beside that, female education is still lagging behind male education.
- Concerning health care facilities in the area, almost every given household in the area has witnessed under-five infant mortality indicating the weakness of these facilities and the fragile nutrition

status of the households.

- Money remitted by emigrants to their relative farmers is only a few sum of money and cannot participate in capital formation for efficient farm investment.
- Although the dominating type of land ownership is small plots private ownership, which lacks secure individual and use rights over the land, there is higher inequality of land distribution among land owners which necessitate intervention for land reform pro-small farmers .
- And that, small holders, who possess these small size plots(1-4 feddans) are neither leaser-in or leaser-out land, and that who possess plots size (5-14 feddans) are leaser-in some land, while those who possess land size(15+ feddans) are leaser-out some land to others or let the land lie fallow.
- Small farmers who own small size plots are more efficient in Dura and Sesame production compared to those who own large size plots and produce the same crops.
- Most of the small farmers used to take part of their Dura production to the market to meet urgent cash requirements, despite the fact that Dura is subsistence crop for their households.
- Often, and due to urgent cash requirements, small farmers make unfair deals in the crops market with traders and loose chances to increase farm revenues.
- Small farmers can increase their incomes if they could wait until the stock of crops run short in the market and prices rise up, but often they couldn't.
- Family workers to the most of small farmers is range between 1 to 2 workers, and thus the role family labor as basic unit of production is declining.
- The size of cultivated land is expected to decrease due to decrease in the number of family workers, because availability of family workers, always, determines the size of land cultivated by

household.

- Family workers are not sufficient to carry out the required farm activities as before.
- Male workers are preferred in agricultural activities more than female workers.
- Hired labor has become crucial element for small farmers to produce efficient production in different cultivated crops.
- There is significant relation between the availability of hired workers and the size of land cultivated.
- 'Nafeer' labor is diminishing in value as one of the three type of labor organization in the area due to the increase in the cost of Nafeer requirements.
- Female workers response to agricultural low wages more than male workers.
- Dura crop requires more hired workers than is required in Sesame crop production which use tractor in some operations. Cost of production in Dura crop is higher than the cost of Sesame production despite the fact that prices of Sesame is always higher than the prices of Dura crop.
- Credit sources are limited in numbers to cover widely dispersed local farmers across the remote rural areas.
- The lion share of the total size of the credit loan to small farmers comes from NGOs .
- Shayel system is still functioning as the most crucial credit source, particularly, in the remote rural areas. Small farmers have limited access to credit facilities.
- Nevertheless, loan repayment affects and determines date of selling crops, which is usually at the beginning and during harvest time when the prices are low.
- Type of land ownership affect access of small farmers to credit from official credit institutions although land has no individual

security rights.

- Private ownership to the land increases access of the farmer to the credit.
- Often small farmers sell their properties under economic pressures to meet some basic necessities of the households.
- Food poverty is widely spread among the different land size groups, particularly among those who cultivate 10+ feedans

4.9 Part two

4.10 Analysis of the Qualitative Data:

4.10.1 Introduction:

As is said in the beginning of chapter four, chapter four is divided into two main parts; part one deals with quantitative data and part two deals with qualitative data. Part one is treated in the previous lines. So, this part is the second part of chapter four which deals with processing, analyzing, and discussing qualitative data.

The bulk of the data is collected from the study field using questionnaire as the main tool of data collection of the study. Nevertheless, secondary sources are also used in collecting some necessary data, in particular, sources like references, documents, internet, official reports, researches, and scientific magazines.

Actually, the sample size of the study, as is illustrated in chapter one, is composed of 400 households . But in part one, the sample size has been lessened to 236 households, because some filled questionnaire forms were lost or damaged during re-entry period, due to some delays during the first entry period. In this part, the sample size of the study is 400 and distributed among the old administrative localities of the region according to size of population as is mentioned before. Below, are procedures followed in the analysis of qualitative data:

4.10.2 Pre-test of the field study:

To determine whether the questionnaire is reliable and valid, pre-test is carried out. The essence of this test is to make sure that, the questionnaire is accurate and precise to give the same and adequate results over time. So,10% of total sample size amounting to 40 forms of the questionnaire, were distributed, randomly, to be filled by some respondents in study area. The objective of the pre-test as is said, is to make sure that the questionnaire is internally consistent to give reliable and valid results over time. The method used for that pre-test, is Cronbach Alpha coefficient as shown in the following equation:

a) Cronbach Alpha:

$$\alpha = \frac{k}{k_{-1}}\left(1 - \frac{\sum \delta^n}{\delta_t^{\,n}}\right)$$

Where: k = number of items

Σσ =total variances of the items.

b) Standard deviation of Cornbach Alpha coefficient:

$$\alpha = \frac{N - r^-}{1 + (N-1) - r^-}$$

Where:

N = number of statements

r = average coefficient of variance

Therefore, reliability and validity according to cronbach alpha for the seventh axes of the questionnaire is as follows:

1. Reliability of first axis (Government Intervention Policies are redirecting local resources away from the local people). Shown in the table below:

Tables 4.10.2.1 Reliability Statistics of first Axis

Cronbach's Alpha	No. of Items
.814	6

Source: Questionnaire of the field study, 2012.

Table 4.10.2.1 Illustrates that the reliability coefficient for the answers to the questions of the sample, is 81%. The validity is the square root of reliability coefficient is 90%, which indicates that the questionnaire in the first axis is characterized by a high degree of consistency and honesty, which serve the purpose of the study and makes the results acceptable and accurate overtime.

2-Reliability of the second axis (Local producers are not participating in formulating the agricultural intervention policies) is shown in the table below:

Tables 4.10.2.2 Reliability Statistics of second Axis:

Cronbach's Alpha	No. of Items
.724	5

Source: The work of the field study, 2012.

Table 4.10.2.2 Illustrates that reliability coefficient for the answers to the questions of the sample is 72%. The validity is the square root of reliability coefficient amount to 84%, which indicates that, the questionnaire in the second axis is characterized by a high degree of consistency and honesty, which serves the purpose of the study and makes the results more accurate and acceptable.

3- Reliability of the third axis (Agricultural intervention policies leaded to the erosion of small farmers capacities to the extent that food provision has become one of the main difficulties)is shown in the table below:

Tables 4.10.2.3 Reliability Statistics of third Axis

Cronbach's Alpha	No. of Items

Cronbach's Alpha	No. of Items
.690	6

Source: Questionnaire of the field study, 2012.

Table4.10.2.3 illustrates that the reliability coefficient for the answers to the questions of the sample is 69%. The validity is the square root of reliability coefficient amount to 83%, which indicates that, the questionnaire in the third axis is characterized by a high degree of consistency and honesty, which serves the purpose of the study and makes the results more accurate and acceptable over time.

4- Reliability of the fourth axis (Investment in human resource development and the infrastructure gives small farmers the necessary tools for sustainable development) is shown in table below:

Table 4 .10.2.4 Reliability Statistics of fourth Axis

Cronbach's Alpha	No. of Items
.793	5

Source: The work of field study, 2012.

Table4.10.2.4 illustrates that the reliability coefficient for the answers to the questions of the sample is.79%. The validity is the square root of reliability coefficient amounts to 89%, which indicates that, the questionnaire of the study is characterized by a high degree of consistency and honesty, which serves the purpose of the study and makes the results more accurate and acceptable.

5- Reliability of the fifth axis (Agricultural intervention policies have put local small farmers in a poverty trap) is shown in the table below:

Table 4.10.2.5 Reliability Statistics of fifth Axis

Cronbach's Alpha	No. of Items
.617	5

Source: Questionnaire of the field study, 2012.

Table4.9.5 illustrates that the reliability coefficient for the answers to the questions of the sample is 62%. The validity is the square root of reliability coefficient and is amounts to 78%, which indicates that, the questionnaire of the study is characterized by a high degree of consistency and honesty, which serves the purpose of the study and makes the results more accurate and acceptable.

6- Reliability of the sixth axis (Small farmers in the Nubba Mountains could not expand their production, unless, they are empowered) is shown in the table below:

Table 4.10.2. 6 Reliability Statistics of sixth Axis

Cronbach's Alpha	No. of Items
.765	5

Source: Questionnaire of the field study, 2012.

Table 4.10. 2.6 Illustrates that the reliability coefficient for the answers to the questions of the sample is 76%. The validity is the square root of reliability coefficient and is amounts to 7%, which indicates that, the questionnaire of the study is characterized by a high degree of consistency and honesty, which serves the purpose of the study and makes the results more accurate and acceptable.

7- Reliability of the seventh axis(Agricultural intervention policies are responsible for the shortage in food production in the area) is shown in the table below:

Tables 4.10.2. 7 shows the Reliability Statistics seventh Axis

Cronbach's Alpha	No. of Items
.877	6

Source: Questionnaire of the field study, 2012.

Table4.10.2. 7 illustrates that the reliability coefficient for the answers to the questions of the sample is 88%. The validity is the square root of

reliability coefficient and is amounts to 94%, which indicates that, the questionnaire of the study is characterized by a high degree of consistency and honesty, which serves the purpose of the study and makes the results more accurate and acceptable over time.

Table 4.11 Five-level Likert item measurement.

This part of this chapter uses in the processing of qualitative data as follows:

Scaling words	Weight
Strongly agree	5
Agree	4
Not sure	3
Not agree	2
Not agree at all	1

So, Based on the above measurement, the study determines first the value of the interval using the following equation and then determine degree of each response to the definite question.

Interval = maxi. Value - mini. Value

Maximum value

$$= \frac{5-1}{5} = \frac{4}{5} = 0.80$$

Accordingly, responses of the respondents to the questions of statements or items will take the following weights:

Strongly agree = 4.20>5, agree = 3.40< 4.20, not sure = 2.60< 3.40, not agree =1.80< 2.60, not agree at all = 1.00<1.80

4.12 Analysis of the personal data:

Most of the questions asked, concerning personal data, in both

quantitative and qualitative questionnaires, are quite similar or more precisely they are identical questions. This means the results of the analysis of personal data, here and there, will be the same in both questionnaires. Therefore, the study to avoid repetition is content with the personal analysis treated in part one. Consequently, the study goes directly to the analysis of the qualitative questionnaire statements as shown below:

4.13 Analysis of the questionnaire statements:

This questionnaire is composed of seven axes and each axis is composed of a number of statements. All of this is intended to cover all questions needed to test study hypotheses. So, the processes and analysis of each axis is shown as follows:

The first axis: Government Intervention Policies are redirecting local resources away from the local people

Table 4.13.1 frequencies and percentages responses to statements of the first Axis.

Statement	Not agree at all		Not Agree		Not sure		agree		Agree strongly		Mean	Std.
	No.	%	No.	%	No.	%	No.	%	No.	%		
Agricultural Intervention Policies advocated for the mechanization, while local producers failed to provide.	2	.5	10	2.5	8	2	144	36	236	59	4.5	.708
Agricultural intervention policies responsible for pushing local producers to wards the less fertile lands (Gurdud lands).	38	9.5	18	4.5	22	5.5	140	35	182	45.5	4.2	1.244
The routes of the pastoralists affected negatively by the demarcation of the big schemes as policy of the agricultural intervention in the area	-	-	18	4.5	112	28	122	30.5	148	37	4	.912
The shifting type of agriculture has become threatened after the demarcation	8	2	12	3	50	12.5	168	42	162	40.5	4.16	.912

of big scheme												
Agricultural intervention policies responsible for the decline food production of local people	2	.5	36	9	48	12	152	38	162	40.5	4.9	.961
Local people of the Nuba Mountains failed to satisfy the conditions of big schemes allocation and their land went to others.	2	.5	10	2.5	54	13.9	134	33.5	200	50	4.3	.832

Source: Questionnaire of field study, 2012.

Table 4.13.1 shows frequencies and percents of respondents' answers to the statements of the first axis of the questionnaire. Accordingly, we can reorder these statements basing on their values of arithmetic mean as is shown in table 4.13.1.

Table 4.13.2 Order of Responses of Study Sample to Statements of the first Axis According to Arithmetic mean

	NO.	Minimum	Maximum	Mean	Std. Deviation
Agricultural Intervention Policies advocated for the mechanization, while local producers failed to provide the required mechanization.	400	1	5	4.50	.708
Inhabitants of the Nuba Mountains failed to satisfy conditions for allocation of the big schemes, therefore, their land went to others.	400	1	5	4.30	.832
The shifting type of agriculture has threatened in the area, after the demarcation of big scheme.	400	1	5	4.16	.898
Agricultural intervention policies caused food production of local people to declined because the priority of the policies was on the cash crop production	400	1	5	4.09	.961
Agricultural intervention policies are responsible for the confinement the local producers in the less fertile lands (Gurdud lands).	400	1	5	4.02	1.244

The routes of the pastoralists are affected negatively by the demarcation of the big schemes as policy of the agricultural intervention in the area	400	2	5	4.00	.912

Source: Questionnaire of field study, 2012.

Table 4.13.2 shows the order of respondents' answers to the statements of the first axis according to degree of agreement. It's noticed that only one statement lies in category of strongly agree and 5 statements in the category of agree as follows:

1. In the top of the list stands the first statement which says" Agricultural Intervention Policies advocated for the mechanization, while local producers failed to provide the required mechanization" with mean 4.50 and standard deviation 0.708
2. In the second rank comes the statement 6 which says" Inhabitants of the Nuba Mountains failed to satisfy conditions for allocation of the big schemes, therefore, their land went to outsiders" with mean 4.30 and standard deviation .832.
3. In the order three comes statement 4 "The shifting type of agriculture has become limited in the area, after the demarcation of big scheme" with mean 4.16 and standard deviation .898
4. In the fourth order stands statement 5 which says "agricultural intervention policies caused food production of local people to decline because the priority of these policies was cash crop production" with mean 4.09 and standard deviation .912
5. In the fifth order stands statement 2 which says "Agricultural intervention policies are responsible for the confinement the local producers in the less fertile lands (Gurdud lands" with mean 4.02 and standard deviation 1.244
6. In the sixth order stands statement 3 which says "The routes of the pastoralists are affected negatively by the demarcation of the big schemes as policy of the agricultural intervention in the area" with

mean 4.00 and standard deviation .912

To check the reason causing the first Axis from the viewpoint of study respondents' Chi-square test is done to the statements as shown in the following table:

Table 4.13.3 Chi square Statistics Test for the Statements of the first Axis.

	Agricultural Intervention Policies advocated for the mechanization, while local producers failed to provide the mechanization	Inhabitants of the Nuba Mountains failed to satisfy conditions for granting big schemes, therefore, their land went to others.	The shifting type of agriculture has become limited in the area, after the demarcation of big scheme.	Agricultural intervention policies caused food production of local people to decrease because the concentration of the policies is on the cash crop production	Agricultural intervention policies are responsible for the confinement the local producers in the less fertile lands (Gurdud lands).	The routes of the pastoralists are affected negatively by the demarcation of the big schemes as policy of the agricultural intervention in the area
Chi-Square	557.500a	362.200a	314.700a	261.900a	287.200a	96.560b

df	4	4	4	4	4	3
Asymp. Sig.	.000	.000	.000	.000	.000	.000

Source: Questionnaire of the field study, 2012.

Table 4.13.3 shows the following:

1. illustrates that the value of Chi square test of statement 6 is (96.560b) at degree of freedom 3, and level of significance (0.000) which is less than p-value ($\alpha = 0.05$). Therefore, we accept the null hypothesis (no significant differences between the expected frequencies and the observed) which means that major of the sample study agree with the statement "The routes of the pastoralists are affected negatively by the demarcation of the big schemes as policy of the agricultural intervention in the area." this is because the values of the mean is (4.00) according to the five-Level Likert item measurement.
2. Illustrates that the value of Chi square test of statement 5 is (287.200a), at degree of freedom 4, and level of significance (0.000) which is less than p-value ($\alpha = 0.05$). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement "Agricultural intervention policies are responsible for the confinement the local producers in the less fertile lands (Gurdud lands).." this is because the values of the mean is (4.02) according to the five-Level Likert item measurement.
3. Illustrates that the value of Chi square test of statement 4 is (261.900a) at degree of freedom 4, and level of significance (0.000) which is less than p-value ($\alpha = 0.05$). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement "Agricultural intervention policies caused food production of local people to decrease because

the concentration of the policies is on the cash crop production “this is because the values of the mean (4.09) according to the five- level Likert item measurement.

4. illustrates that the value of Chi square test of statement 3 is (314.700a) at degree of freedom 4 , and level of significance (0.000) which is less than p-value ($\alpha = 0.05$) .Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement “ The shifting type of agriculture has become limited in the area, after the demarcation of big scheme..” this is because the values of the mean (4.16) according to the five-level Likert item measurement .
5. illustrates that the value of Chi square test of statement 2 is (362.200a), at degree of freedom 4 , and level of significance (0.000) which is less than p-value ($\alpha = 0.05$) and therefore we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement “ Inhabitants of the Nuba Mountains failed to satisfy conditions for granting big schemes, therefore, their land went to outsiders.” this is because the value of the mean was (4.30) on according to the five- level Likert item measurement.
6. illustrates that the value of Chi square test of statement 1 is (557.500a), at degree of freedom is 4 , and level of significance (0.000) which is less than p-value ($\alpha = 0.05$) and therefore we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement “Agricultural Intervention Policies advocated for the mechanization, while local producers failed to provide “ this is because the values of the mean (4.50) according to the five-level Likert item measurement

Table 4.13.4 Frequencies and Percentages responses to the Statements of Second Axis.

Statement	Not agree at all		Not Agree		Not sure		Agree		Agree strongly		Mean	Std.
	No.	%	No.	%	No	%	No.	%	No.	%		
Agricultural intervention policies ignored local experience.	-	-	-	-	18	4.5	88	22	294	73.5	4.69	.552
Farmers do not participate in preparations, planning, and implementation of the agricultural intervention policies.	-	-	2	.5	18	4.5	92	23	288	72	4.66	.586
Agricultural activities in the intervention policies did not include sufficient training projects for the local farmers.	-	-	-	-	22	5.5	72	18	306	76.5	4.71	.563
The objectives of the agricultural intervention policies contrasted with objectives of the local farmers.	-	-	6	1.5	24	6	94	23.5	276	69	4.6	.672
The voice of local farmer is not heard because he lacks organized body representative of farmers, so his rights are lost.	2	.5	6	1.5	6	1.5	66	16.5	320	80	4.74	.611

Source: Questionnaire of field study, 2012.

Table 4.13.4 shows frequencies and percents of respondents' answers to the statements of the second axis of the questionnaire. Accordingly, we can reorder these statements, basing on their values of arithmetic means, to find out the degree of importance of each response to second axis as follows in table 4.13.5.

Table 4.13.5 order Responses of the Study Sample to the Statements of second Axis According to values of means.

	No	Minimum	Maximum	Mean	Std. Deviation
The voice of local farmer is not heard because he lacks organized body representative of farmers, so his rights are lost.	400	1	5	4.74	.611
Agricultural activities in the intervention policies did not include any training projects for the local farmers.	400	3	5	4.71	.563
Agricultural intervention policies ignored the local experience	400	3	5	4.69	.552
Farmers do not participate in preparations, planning, and implementation of the agricultural intervention policies	400	2	5	4.66	.586
The objectives of the agricultural intervention policies contrasted with objectives of the local farmers.	400	2	5	4.60	.672

Source: Questionnaire of field study, 2012.

Table 4.13.5 illustrates the order of respondents' answers to the statements of the second axis according to the degree of agreement. It is noticed that the whole statements fall into one category. Nevertheless, we can reorder those using values of arithmetic means to reach degree of their importance to influence the axis from the viewpoint of study

respondents as follows:

1. In the top of the list stands statement 5 which says “The voice of local farmer is not heard because he lacks organized body of farmers, so his rights are lost” with mean 4.71 and standard deviation .611
2. In the second order stands statement 3 which says” Agricultural activities in the intervention policies did not include any training projects for the local producers” with mean 4.71 and standard deviation .536
3. In the third place stands statement 1which says “agricultural intervention policies ignored the local long time experience” with mean 4.69 and standard deviation .552
4. In the fourth order stands statement 2 which says “farmers of the area do not participate in preparations, planning, and implementation of the agricultural intervention policies” with mean 4.66 and standard deviation .586
5. I the fifth order stand statement 4 which says “the objectives of the agricultural intervention policies contrasted the objective of the local farmers” with mean 4.60 and standard deviation .672

To investigate the reasons behind second axis from the viewpoint of study sample Chi-Square Test is done as is shown in table 4.13.6.

Table 4.13.6 Chi square Statistics Test for the Statements Second Axis.

	The voice of local farmer is not heard because he lacks organized body represntative of farmers, so his rights are lost.	Agricultural activities in the intervention policies did not include any training projects for the local farmers.	Agricultural intervention policies ignored local experience	Farmers of the area do not participate in preparations, planning, and implementation of the agricultural intervention policies	The objectives of the agricultural intervention policies contrasted with objectives of the local farmers.
Chi-Square	935.40c	344.780a	308.780a	517.360b	456.240b
df	4	2	2	3	3
Asymp. Sig.	.000	.000	.000	.000	.000

Source: Questionnaire of field study, 2012.

Table 4.13.6 illustrates the following:

1. illustrates that the value of chi square test of statement 1 is (935.40c) at degree of freedom 4 , and level of significance (0.000) which is less than p-value ($\alpha = 0.05$). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which mean that majority of the sample study agree with the statement " The voice of local farmer is not heard because he lacks organized body of farmers, so his rights are lost " this is because the values of the mean (4.74) on the bases of five-level Likert item measurement.
2. illustrate that the value of Chi square test of statement 2 is (344.780a) at degree of freedom 2, and level of significance (0.000) which is less than p-value ($\alpha = 0.05$). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement "Agricultural

activities in the intervention policies did not include any training projects for the local producers “this is because the values of the mean (4.71) on the of five-level Likert item measurement.

3. illustrate that the value of Chi square test of statement 3 is (308.780a) at degree of freedom 2, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which mean that majority of the sample study agree with the statement “Agricultural intervention policies ignored the local long time experience “ this is because the values of the mean (4.69) on the bases of five-level Likert item measurement..
4. illustrate that the value of chi square test of statement4 is (517.360b),degree of freedom is 3 ,the level of significance (0.000) which is less than p-value (α = 0.05) . Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement “Farmers of the area do not participate in preparations, planning, and implementation of the agricultural intervention policies “this is because the values of the mean (4.66) on the bases of five-level Likert item measurement.
5. illustrate that the value of Chi square test of statement 5 is (456.24) at degree of freedom 3, and level of significance (0.000) which less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement “The objectives of the agricultural intervention policies contrasted the objective of the local farmers “this is because the values of the mean (4.60) on the bases of five-level Likert item measurement.

Table 4.13.7 Frequencies and Percentages Responses to Statements of the Third Axis.

Statement	Not agree at all		Not Agree		Not sure		Agree		Agree strongly		Mean	Std.
	No.	%	No.	%	No.	%	No.	%	No.	%		
Agricultural intervention policies allocated the most fertile land in the area to the producers from outside the area.	22	5.5	42	10.5	14	3.5	80	20	242	60	4.2	1.233
Demarcation of the big schemes has affected negatively on the routes of the pastoralists.	-	-	8	2	92	23	128	32	172	43	4.16	.84628
Credit guarantees and conditions from the Agric Bank are redirecting financial resources of the bank from small farmers to the big farmers.	4	1	4	1	66	16.5	134	33.5	192	48	4.26	.841
The technology of production is traditional because production is for subsistence.	5	1.5	-	-	15	3.8	150	37.5	230	57.5	4.5	.704
Crop prices imposed without regard to production costs.	108	27	6	1.5	8	2	62	15.5	216	54	368.	1.719
In good seasons excess production is disposed non-economically for the lack of storage facilities.	104	26	8	2	20	5	62	15.5	206	51.5	3.65	1.693

Source: Questionnaire of field study, 2012

Table 4.13.7 illustrates frequencies and percentages for responses of the study sample to the statements of third axis of the questionnaire. So, basing on values of arithmetic means we can order these responses to find out the degree of importance of each response to third axis as follows:

Table 4.13. 8 Order of Responses to the Statements of the Third Axis

	No.	Minimum	Maximum	Mean	Std. Deviation
The technology of production is traditional because production is for subsistence.	400	1	5	4.50	.704
Credit guarantees and conditions from the Agric Bank are redirecting financial resources of the bank from small farmers to the big farmers.	400	1	5	4.26	.841
Agricultural intervention policies allocated the most fertile land in the area to the producers from outside the area.	400	1	5	4.20	1.233
Demarcation of the big schemes has affected negatively on the routes of the pastoralists.	400	2	5	4.1600	.84628
Crop prices imposed without regard to production costs.	400	1	5	3.68	1.719
In good seasons excess production is disposed non-economically for the lack of storage facilities	400	1	5	3.65	1.693

Source: Questionnaire of field study, 2012.

Table 4.13.8 illustrates the order of responses of the study sample to the statements of third axis. It's noticed that one statement fall in the category strongly agree and the rest in the category of agree according

to the values of arithmetic means as shown below:

1. in the top of the list stands statement 4 which says “The technology of production is traditional because production is for subsistence” with mean 4.50 and standard deviation .704
2. in the second order stands statement 3 which says “Credit guarantees and conditions from the Agric Bank are redirecting financial resources of the bank from small farmers to the big farmers "with mean value 4.26 and standard deviation .841
3. in the third order stands statement 1 which says” Agricultural intervention policies allocated the most fertile land in the area to the producers from outside the area” with mean 4.20 and standard deviation 1.233
4. in the fourth order stands statement 2 which says” Demarcation of the big schemes has affected negatively on the routes of the pastoralists ”with mean 4.1600 and standard deviation .84628
5. in the fifth order stands statement 5 which says” Crop prices imposed without regard to production costs” with mean3.68 and standard deviation1.719
6. in the sixth order stands statement 6 which says” In good seasons excess production is disposed non-economically for the lack of storage facilities ”with mean value 3.65 and standard deviation1.6393

To investigate the third axis from the point of view of the study sample was tested Chi-Square Test which are shown in the following table 4.19.9

Table 4.13.9 Chi square statistics test for the Statements of the Third Axis.

	The technology of production is traditional because production is for subsistence	Credit guarantees and conditions from the Agric Bank are redirecting financial resources of the bank from small farmers to the big farmers	Agricultural intervention policies allocated the most fertile land in the area to the producers from outside the area	Demarcation of the big schemes has affected negatively on the routes of the pastoralists	Crop prices imposed without regard to production costs	In good seasons excess production is disposed non-economically for the lack of storage facilities
Chi-Square	545.525a	340.100a	442.600a	144.960b	378.300a	319.500a
df	4	4	4	3	4	4
Asymp. Sig.	.000	.000	.000	.000	.000	.000

Source: Questionnaire of field study, 2012.

Table 4.13.9 illustrates the following:

1. illustrate that the value of Chi square test of statement 4 is (545.525a) at degree of freedom 4, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agrees with the statement "The technology of production is traditional because production is for subsistence" this is because the values of the mean (4.60) on the

bases of five- level Likert item measurement.

2. illustrate that the value of Chi square test of statement 3 is (340.100a) at degree of freedom 4, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement "Credit guarantees and conditions from the Agric Bank are redirecting financial resources of the bank from small farmers to the big farmers "this is because the values of the mean (4.26) on the bases of five-level Likert item measurement.
3. lustrate that the value of Chi square test of statement 1 is (442.600a) at degree of freedom is 4, the level of significance (0.000) which less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement "Agricultural intervention policies allocated the most fertile land in the area to the producers from outside the area "this is because the values of the mean (4.20) on the bases of five level Likert item measurement.
4. lustrate that the value of Chi square test of statement 2 is (144.960b) at degree of freedom 3, and level of significance (0.000) which less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement "Demarcation of the big schemes has affected negatively on the routes of the pastoralists "this is because the values of the mean (4.16) on the bases of five-level Likert item measurement.
5. lustrates that the value of Chi square test of statement 5 is

(378.300a) at degree of freedom 4, and level of significance (0.000) is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement “Crop prices imposed without regard to production costs “this is because the values of the mean (3.68) on the bases of five-level Likert item measurement.

6. lustrates that the value of Chi square test 6 is (319.500a) at degree of freedom 4, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agrees with the statement “In good seasons excess production is disposed non-economically for the lack of storage facilities “this is because the values of the mean (3.65) on the bases of five-level Likert item measurement.

Table 4.13.10 Frequencies and Percentages Responses to Statements Fourth Axis.

Statements	Not agree at all		Not agree		Not sure		agree		Agree strongly		Mean	Std.
	No.	%	No.	%	No.	%	No.	%	No.	%		
Provision of drinking water near the production areas reduces effort, time and the production costs.	-	-	2	.5	8	2	54	13.5	336	84	4.81	.508
Increasing the access of health facilities leads to the increase of production and income of the all people	-	-	-	-	14	3.5	52	13	334	83.5	4.8	.480
Linking the region by net work of roads reduces production costs.	2	.5	2	.5	24	6	74	18.5	298	74.5	4.66	.660
Participation of small producers in developing markets helps in increasing production of small	2	.5	2	.5	22	5.5	94	23.5	280	70	4.62	.661

farmers and then improves their life conditions												
Education and training increase framer's knowledge and develops their skills and changes their behavior towards better production so they are in need of education and training	4	1	2	.5	4	1	46	11.5	344	86	4.81	.57

Source: Questionnaire of field study, 2012.

Table 4.13.10 illustrates frequencies and percentages of the responses of sample study to the statements of the fourth axis of the questionnaire. Accordingly, we can order these responses basing on the degree of importance of each statement to the fourth axis using arithmetic means as follows:

Table 4.13.11 Order of Responses to the Statement of Fourth Axis

	No.	Minimum	Maximum	Mean	Std. Deviation
Provision of drinking water near the production areas reduces effort, time and the production costs.	40	1	5	4.81	.508
Education and training increase framer's knowledge and develops their skills and changes their behavior towards better production so they are in need of education and training	40	1	5	4.81	.570
Increasing the access of health facilities leads to the increase of production and income of the all people	40	3	5	4.80	.480
Linking the region roads reduces production costs.	40	1	5	4.66	.660
Participation of small producers in developing markets helps in increasing production of small farmers and then improves their life conditions	40	1	5	4.62	.661

Source: Questionnaire of field study, 2012.

Table 4.13.11 illustrates that responses of the study sample to the statements of the fourth axis fall in the category of strongly agree.

Nevertheless, they are prioritized in the following order depending on the values of arithmetic means:

1. in the top of the list stands statement 1which “says Provision of drinking water near the production areas reduces effort, time and the production costs” with mean 4.81and standard deviation.508
2. In the second order stands statement 5 which says “Education and training increase framer’s knowledge and develops their skills and changes their behavior towards better production so they are in need of education and training” with mean 4.81 and standard deviation .570
3. in the third order stands statement 2 which says” Increasing the access of health facilities leads to the increase of production and income of the all people ”with mean 4.80 and standard deviation .480
4. In the fourth order stands statement 3 which says” Linking the region roads reduces production costs” with mean 4.66 and standard deviation.660
5. in fifth order stands statement 4 which says” Participation of small producers in developing markets helps in increasing production of small farmers and then improves their life conditions” with mean 4.62 and standard deviation .661

To investigate the causes behind the fourth axis from the viewpoint of the study sample, Chi-Square Test is done as shown in the table below:

Table 4.13.12 Chi square Statistics test for statements of the fourth Axis.

	Provision of drinking water near the production areas reduces effort, time and the production costs.	Education and training increase framer's knowledge and develops their skills and changes their behavior towards better production so they are in need of education and training	Increasing the access of health facilities leads to the increase of production and income of the all people	Linking the region roads reduces production costs.	Participation of small producers in developing markets helps in increasing production of small farmers and then improves their life conditions
Chi-Square	758.800a	1106.100c	458.420b	785.800c	696.600c
df	3	4	2	4	4
Asymp. Sig.	.000	.000	.000	.000	.000

Source: Questionnaire of field study, 2012.

Table 4.13.12 illustrates the following:

1. That the value of Chi square test of the statement 1 is (758.800a) at degree of freedom 3, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agrees with the statement "Provision of drinking water near the production areas reduces effort, time and the production costs. "This is because the values of the mean (4.81) on the bases of five-level Likert item measurement.

2. That the value of Chi square test of statement 5 is (1106.100c)at degree of freedom 4 ,and level of significance (0.000) which is less than p-value (α = 0.05) .Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Education and training increase framer's knowledge and develops their skills and changes their behavior towards better production so they are in need of education and training " this is because the values of the mean (4.81) on the bases of five-level Likert item measurement.
3. That the value of Chi square test of statement 2 is (458.420b) at degree of freedom 4, and level of significance (0.000) is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Increasing the access of health facilities leads to the increase of production and income of the all people " this is because the values of the mean (4.80) on the bases of five- level Likert item measurement.
4. That the value of chi square test of statement 3 is (785.800c) at degree of freedom 2, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agrees with the statement "Linking the region roads reduces production costs" this is because the values of the mean (4.66) on the bases of five-level Likert item measurement.
5. That the value of Chi square test of statement 4 is (696.600c) at degree of freedom 4, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected

frequencies and the observed) which means that majority of the sample study agree with the statement " Participation of small producers in developing markets helps in increasing production of small farmers and then improves their life conditions " this is because the values of the mean (4.62) on the bases of five-level Likert item measurement.

Table 4.13.13 Frequencies and Percentages Responses to Statements of fifth Axis.

Statements	Not agree at all		Not Agree		Not sure		agree		Agree strongly		Mean	Std
	No.	%	No.	%	No.	%	No.	%	No.	%		
Depending on one source of living (agriculture) leaded to the spread of poverty among farmers.	6	1.5	2	.5	16	4	70	17.5	306	57	4.67	.716
Productivity and production is annually deteriorating causing annual deterioration of living conditions of the small farmers	-	-	6	1.5	34	8.5	132	33	228	57	4.45	.714
Relief distribution has become permanent phenomena in the area.	54	13.5	46	11.5	92	23	68	17	140	35	3.48	1.423
Without comprehensive reforms small farmers will not be able for any	-	-	2	.5	26	6.5	15	38	220	55	4.48	.641

type of investment.							2					
Peasant's households are facing food insecurity.	14	3.5	18	4.5	70	17.5	80	20.5	216	54	4.17	1.o88

Source: Questionnaire of field, 2012

Table 4.13.13 illustrates frequencies and percentages of study sample's responses to the statements of fifth axis of questionnaire. Accordingly, we can order these responses, basing on the degree of importance of each statement to the fifth axis, using arithmetic means as follows:

Table 4.13.14 Order of Responses to the Statements of the fifth Axis.

	No.	Minimum	Maximum	Mean	Std. Deviation
Depending on one source of living (agriculture) leaded to the spread of poverty among farmers.	400	1	5	4.67	.716
Productivity and production is annually deteriorating causing annual deterioration of living conditions of the small farmers.	400	2	5	4.45	.714
Without comprehensive reforms small farmers will not be able for any type of investment.	400	2	5	4.48	.641
Peasant's households are facing food insecurity.	400	1	5	4.17	1.088
Relief distribution has become permanent phenomena in the area.	400	0	5	3.48	1.423

Source: Questionnaire of field study, 2012.

Table 4.13. 14 illustrates the order of responses of the study sample to the statements of the fifth axis. So, according to these responses one statement falls in the category of strongly agree and four statements fall in the category of agree and they are prioritized depending on the value of means as follows:

1. In the top of the list stands statement 1which says" Depending on one source of living (agriculture) leaded to the spread of poverty among farmers" with mean4.67 and standard deviation.716
2. in the second order stands the statement 2 which says" Productivity and production is annually deteriorating causing annual deterioration of living conditions of the small farmers" with mean4.45 and standard deviation .714
3. in third order stands statement 4 which says" Without comprehensive reforms small farmers will not be able for any type of investment "with mean4.48 and standard deviation .641
4. In the fourth order stands statement 5 which says" Peasant's households are facing food insecurity" with mean 4.17 and standard deviation 1.088
5. In the fifth order stands statement 3 which says" Relief distribution has become permanent phenomena in the area" with mean 3.48 and standard deviation 1.423

To investigate the causes behind the fifth axis from the viewpoint of the study sample Chi-Square Test is done as shown in table 4.13.15

Table 4.13.15 Chi square Statistics Test for the statement of the fifth Axis.

	Depending on one source of living (agriculture) leaded to the spread of poverty among farmers	Productivity and production is annually deteriorating causing annual deterioration of living conditions of the small farmers	Without comprehensive reforms small farmers will not be able for any type of investment	Peasant's households are facing food insecurity	Relive distribution have become permanent phenomena in the area

Chi-Square	835.40a	306.000b	321.840b	335.000a	162.680c
df	4	3	3	4	4
Asymp. Sig.	.000	.000	.000	.000	.000

Source: field study by the researcher, 2012.

Table 4.13.15 illustrates the following:

1. That the value of Chi square test of statement 1 is (835.40a) at degree of freedom 4 , and level of significance (0.000) which is less than p-value (α = 0.05) .Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Depending on one source of living (agriculture) leaded to the spread of poverty among farmers " this is because the values of the mean (4.67) on the bases of five- level Likert item measurement.
2. That the value of Chi square test of statement 2 is (306.000b) at degree of freedom 3, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Productivity and production is annually deteriorating causing annual deterioration of living conditions of the small farmers " this is because the values of the mean (4.45) on the bases of five-level Likert item measurement.
3. That the value of Chi square test of statement 4 is (321.840b) at degree of freedom 3 , and level of significance (0.000) which is less than p-value (α = 0.05) .Therefore, we accept the argument null hypothesis (no significant differences between the expected

frequencies and the observed) which means that majority of the sample study agree with the statement " Without comprehensive reforms small farmers will not be able for any type of investment " this is because the values of the mean (4.48) on the bases of five-level Likert item measurement.

4. that the value of Chi square test of statement 5 is (335.000a),degree of freedom is 4 ,the level of significance (0.000) is less than the p-value (α = 0.05) and therefore we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Peasant's households are facing food insecurity " this is because the values of the mean (4.17) on the Likert scale according to the five
5. That the value of Chi square test of statement 3 is (162.680c) at degree of freedom 4 ,the level of significance (0.000)which is less than p-value (α = 0.05) ,Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Relief distribution have become permanent phenomena in the area " this is because the values of the mean (3.48) on the bases of five-level Likert item measurement.

Table 4.13.16 Frequencies and Percentages Responses to Statements Sixth Axis.

Statements	Not agree at all		Not Agree		Not sure		Agree		Agree strongly		Mean	Std
	No.	%	No.	%	No.	%	No.	%	No.	%		
Any productive work, particularly agricultural, requires smart participation principles between government and local communities to guarantee and realize objective of both side.	2	.5	-	-	12	3	84	21	302	75.5	4.71	.572
Redistribution of big schemes pro-local communities to enable small farmers practice shifting cultivation to guarantee higher production.	6	1.5	10	2.5	20	5	96	24	268	67	4.53	.825
Change laws and regulations at national and local level to enable local people dominate their resources.	-	-	-	-	26	6.5	200	50	174	43.5	4.37	.603
Change laws and regulations at national and local level to enable	4	1	-	-	22	2.5	74	18.5	300	75	4.67	.674

local people dominate their resources.												
Agricultural authorities must not neglect local experience of the local producers.	4	1	-	-	12	3	100	25	284	71	4.65	.639

Source: Questionnaire of field study, 2012.

Table 4.13.16 illustrates frequencies and percentages for responses of sample study to the statements of the sixth axis of the questionnaire. So, basing on values of means we can order these responses according to the importance of each response to the sixth axis as follows:

Table 4.13.17 order of responses to the statements of the sixth Axis.

	No.	Minimum	Maximum	Mean	Std. Deviation
Any productive work, particularly agricultural, requires smart participation principles between government and local communities to guarantee and realize objective of both side.	400	1	5	4.71	.572
Problems of agriculture and agriculturists remained un solved because body representing them is absent.	400	1	5	4.67	.674
Agricultural authorities must not neglect local experience of the local producers.	400	1	5	4.65	.639
Redistribution of big schemes pro-local communities to enable small farmers practice shifting cultivation to guarantee higher production.	400	1	5	4.53	.825
Change laws and regulations at national and local level enable local people dominate their resources.	400	3	5	4.37	.603

Source: Questionnaire of field study, 2012.

Table 4.13.17 illustrates that four statements fall in the category of strongly agree and that one statement falls into the category of agree.

Nevertheless, responses are prioritized, depending on the values of arithmetic means, according to their importance to those responses of the study sample to the statements of the sixth axis as follows:

1. In the top of the list stands statement 1 which says" any productive work, particularly agricultural, requires smart participation principles between government and local communities to guarantee and realize objective of both side" with mean 4.71 and standard deviation .572
2. In the second order stands statement 4 which says" Problems of agriculture and agriculturists remained UN solved because body representing them is absent" with means 4.67 and standard deviation .674
3. In the third order stands statement 5 which says" Agricultural authorities must not neglect local experience of the local producers" with mean 4.65 and standard deviation .639.
4. In the fourth order stands statement 2 which says" Redistribution of big schemes pro-local communities to enable small farmers practice shifting cultivation to guarantee higher production" with mean 4.53 and standard deviation .825
5. in the fifth order stands statement 3 which says" Change laws and regulations at national and local level to enable local people dominate their resources "with mean 4.37 and standard deviation .603

To investigate causes behind sixth axis from the viewpoint of the study sample Chi-Square Test is done as shown in table 4.28.18.

Table 4.13.18 Chi square Statistics Test for Statements of the Sixth Axis.

	Any productive work, particularly agricultural, requires smart participation principles between government and local communities to guarantee and realize objective of both side	Problems of agriculture and agriculturists remained un solved because body representing them is absent.	Agricultural authorities must not neglect local experience of the local producers	Redistribution of big schemes pro-local communities to enable small farmers practice shifting cultivation to guarantee higher production	Change laws and regulations at national and local level to enable local people dominate their resources
Chi-Square	584.080a	559.760a	508.160a	619.700b	132.140c
df	3	3	3	4	2
Asymp. Sig.	.000	.000		.000	.000

Source: Questionnaire of field study, 2012.

Table 4.13.18 illustrates the following:

1. That the value of Chi square test 1 of statement is (584.080a) at degree of freedom 3, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no differences significantly between the expected frequencies and the observed) which means that majority of the sample study agree with the statement that " Any productive work, particularly agricultural, requires smart participation principles between government and local communities to guarantee and realize objective of both side " this is because the values of the mean (4.71) on the bases of five-level Likert item

measurement. scale according to the five .

2. That the value of Chi square test of statement 4 is (559.760a) at degree of freedom 3, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement “Problems of agriculture and agriculturists remained un solved because body representing them is absent “this is because the values of the mean (4.67) on the bases of five-level Likert item measurement.
3. That the value of Chi square test of statement 5 is (508.160a) at degree of freedom is 3, the level of significance (0.000) is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Agricultural authorities must not neglect local experience of the local producers " this is because the values of the mean (4.65) on the bases of five- level Likert item measurement.
4. That the value of Chi square test of statement 2 is (619.700b) at degree of freedom 4, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Redistribution of big schemes pro-local communities to enable small farmers practice shifting cultivation to guarantee higher production " this is because the values of the mean was (4.53) on the bases of five-level Likert item measurement.
5. That the value of Chi square test of statement 3 is (132.140c) at degree of freedom 2, and level of significance (0.000) which is less

than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Change laws and regulations at national and local level to enable local people dominate their resources " this is because the values of the mean (4.37) on the bases of five-level Likert scale item measurement.

Table 4.13.19 Frequencies and Percentages Responses to Statements Seventh Axis.

Statements	Not agree at all		Not Agree		Not sure		Agree		Agree strongly		Mean	Std.
	No.	%	No.	%	No.	%	No.	%	No.	%		
Food production decreases because small farmers, due to their demand of money, sell their labor to big farmers instead of working on their own farms	18	4.5	32	8	22	5.5	58	14.5	270	67.5	4.32	1.163
Family labor, the basic unit of production, is fragmented into individual cotton farms pushed by the demand of money to pay the taxes and others	4	1	48	12	50	12.5	132	33	166	41.5	4.02	1.055
Reasons for the widespread of cotton production in the area are administrative colonial arrangements.	5	1.5	-	-	83	20.8	166	41.5	146	36.5	4.13	.799
Reason behind the imposition of'dekenya' tax on the local people was to post up the demand of money in order to local people	4	1	4	1	128	32	116	29	148	37	4.00	.907

adopt cotton production the only source of money at that time.												
Cotton production in area was at the expense of food production.	12	3	-	-	102	25.5	112	28	174	43.5	4.12	.893
The outcome from cotton production was not ample and profitable but the cash money that was given to the farmer upon delivery of cotton was the advantage.	2	.5	-	-	62	15.5	140	35	196	49	4.32	.768

Source: Questionnaire of field study, 2012

Table 4.13.19 illustrates frequencies and percentages for the responses of the study sample to the statements of the seventh axis of the questionnaire. So, basing on values of the means we can order these responses according to the importance of each response to the seventh axis as in the following table:

Table 4.13.20 Order of Responses to the Statements of the Seventh Axis.

	N	Minimum	Maximum	Mean	Std. Deviation
Food production decreases because small farmers, due to their demand of money, sell their labor to big farmers instead of working on their own farms	400	1	5	4.32	1.163
The outcome from cotton production was not ample and profitable but the cash money that was given to the farmer upon delivery of cotton was the advantage	400	1	5	4.32	.768
Reasons for the widespread of cotton production in the area are administrative colonial arrangements.	400	1	5	4.13	.799
Cotton production in area was at the expense of food production.	400	2	5	4.12	.893
Family labor, the basic unit of production, is fragmented into individual cotton farms derived by the demand of money to pay the taxes and others	400	1	5	4.02	1.055

Reason behind the imposition of 'dekenya' tax on the local people was to post up the demand of money in order to local people adopt cotton production the only source of money at that time.	40	1	5	4.00	.907

Source: Questionnaire of field study, 2012

Table 4.13.20 illustrates that responses of the study sample fall in the category of agree. Nevertheless, they prioritized in the following order depending on the values of arithmetic means:

1. In the top of the list stands statement 1which says "Food production decreases because small farmers, due to their demand of money, sell their labor to big farmers instead of working on their own farms" with mean 4.32 and standard deviation 1.163
2. In the second order stands statement 6 which says "The outcome from cotton production was not ample and profitable but the cash money that was given to the farmer upon delivery of cotton was the advantage" with mean 4.32 and standard deviation .768
3. In the third order stands statement 3 which says "Reasons for the widespread of cotton production in the area are administrative colonial arrangements" with mean 4.13 and standard deviation .799
4. In the fourth order stands statement 5 which says" Cotton production in area was at the expense of food production" with mean 4.12 and standard deviation .893
5. In the fifth order stands statement 2 which says" Family labor, the basic unit of production, is fragmented into individual cotton farms derived by the demand of money to pay the taxes and others" with mean4.02 and standard deviation 1.055
6. In the sixth order stands statement 4 which says "Reason behind the imposition of 'dekenya' tax on the local people was to post up

the demand of money in order to local people adopt cotton production the only source of money at that time" with mean 4.00 and standard deviation .907

To Investigate Causes behind the Seventh Axis from the viewpoint of the Study Sample Chi-Square Test is done as shown in table 4.13.21.

Table 4.13. 21 Chi square Statistics Test of Statements of the Seventh Axis

	Food production decreases because small farmers, due to their demand of money, sell their labor to big farmers instead of working on their own farms	The outcome from cotton production was not ample and profitable but the cash money that was given to the farmer upon delivery of cotton was the advantage	Reasons for the widespread of cotton production in the area are administrative colonial arrangements.	Cotton production in area was at the expense of food production.	Family labor, the basic unit of production, is fragmented into individual cotton farms derived by the demand of money to pay the taxes and others	Reason behind the imposition of'dekenya'tax on the local people was to post up the demand of money in order to local people adopt cotton production the only source of money at that time.
Chi-Square	576.200a	218.640b	297.225a	133.680b	222.500a	247.200a
df	4	3	4	3	4	4
Asymp. Sig.	.000	.000	.000	.000	.000	.000

Source: Questionnaire of field study, 2012.

Table 4.13.22 illustrates the following:

1. That the value of Chi square test of statement 1 is (576.200a) at degree of freedom 4, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Food production decreases because small farmers, due to their demand of money, sell their labor to big farmers instead of working on their own farms " this is because the values of the mean (4.32) on the bases

of five-level Likert item measurement.

2. That the value of Chi square test of statement 6 is (218.640b) at degree of freedom 3, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " The outcome from cotton production was not ample and profitable but the cash money that was given to the farmer upon delivery of cotton was the advantage " this is because the values of the mean (4.32) on the bases of five-level Likert item measurement.
3. That the value of Chi square test of statement 3 is (297.225a) at degree of freedom 4, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Reasons for the widespread of cotton production in the area are administrative colonial arrangements. " this is because the values of the mean (4.13) on the bases of five-level Likert item measurement.
4. That the value of Chi square test of statement 5 is (133.680b) at degree of freedom 3, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Cotton production in area was at the expense of food production " this is because the values of the mean (4.12) on the bases of five-level Likert item measurement.
5. That the value of Chi square test of statement 2 is (222.500a c) at degree of freedom 4, and level of significance (0.000) which is less

than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that majority of the sample study agree with the statement " Family labor, the basic unit of production, is fragmented into individual cotton farms derived by the demand of money to pay the taxes and others " this is because the values of the mean (4.02) on the bases of five-level Likert item measurement.

6. That the value of Chi square test of statement 4 is (247.200a),degree of freedom 4 , and level of significance (0.000) which is less than p-value (α = 0.05) . Therefore, we accept the argument null hypothesis (no significant differences between the expected frequencies and the observed) which means that the majority of the sample study agree with the statement " Reason behind the imposition of 'dekenya' tax on the local people was to post up the demand of money in order to local people adopt cotton production the only source of money at that time " this is because the values of the mean (4.00) on the bases of five-level Likert item measurement.

4.14 Test of the Axes:

As is shown in chapter one of this study, there are three main hypotheses, and each of these hypotheses is manifested in a number of phenomenon, which together form the seven axes of the questionnaire . In the previous lines, the study described and tested, statistically, the statements of the questionnaire. Basing upon the results of statements test, the study is testing and describing, statistically, hypotheses of the study as follows:

a) Chi square test statistics for the study axes is shown in the table below:

Table 4.14.1 Chi square Test Statistics for the Study Axes

	First axes	Second axes	Third axes	Fourth axes	Fifth axes	Sixth axes	Seventh axes
Chi-Square	3.405E2a	7.766E2b	2.776E2c	1.330E3d	3.518E2e	520.160f	4.346E2a
df	16	9	14	10	13	11	16
Asymp. Sig.	.000	.000	.000	.000	.000	.000	.000

Source: Questionnaire of field study, 2012.

b) Descriptive statistics for the study axes is shown in table below:

Table 4.14.2 Descriptive Statistics for the Study Axes

	N	Minimum	Maximum	Mean	Std. Deviation
First axes	400	2.33	5.00	4.1800	.67649
Second axes	400	3.00	5.00	4.6810	.41239
Third axes	400	2.67	5.00	4.0738	.77784
Fourth axes	400	3.00	5.00	4.7390	.42958
Fifth axes	400	2.00	5.00	4.2500	.60532
Sixth axes	400	2.20	5.00	4.5840	.47992
Seventh axes	400	2.33	5.00	4.1521	.73982

Source: Field study by the researcher, 2012.

1. Table 4.14.1 and 4.14.2 illustrate that the value of Chi square test of the first axes is (3.405E2a) at degree of freedom16, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we accept the argument null hypothesis (no significant difference between the expected frequencies and the observed) which means that majority of the sample study agree with the statements of the axes "Government Intervention Policies are redirecting local resources away from the local people to others" that is because the values of the mean is (4.1800) on the five-level Likert scale bases.

Basing on the above mentioned, the study finds that government intervention policies are redirecting local resources away from local people of the area because and the following prove that:

a. Local farmers failed to acquire mechanization as a condition to compete in allocation of individual big schemes. b. Local farmers found themselves pushed to "gurdud land "which less in fertility compared to that land demarcated for the benefit of the outsiders.
b. Many of pastoralists lost access to their natural pastures due to the changes in pastoral routes After the area is demarcated as big schemes.
c. Peasants' shifting type of cultivation has become limited to the minimum after the demarcation of land as big schemes.
d. Food production started to decrease because some of some family labor hired out labor for cash.
e. Outsiders succeeded to dominate individual big schemes through conditions of schemes allotment.

2. Table 4.13.1 and 4.13.2 illustrate that the value of Chi square test of the second axes is (7.766E2b) at degree of freedom 9, and level of significance (0.000), which is less than p-value (α = 0.05) and therefore we can accept the argument null hypothesis (no differences significantly between the expected frequencies and viewing duplicates) , which means that majority of the sample study agree

with the statements of the hypothesis " Local producers do not participate in setting agricultural policies although these policies are affecting their lives. " this is because the values of the mean was (4.6810) on the Likert scale bases.

So, basing on the above mentioned, the study finds that local peasants do not participate in the process of formulating agricultural intervention policies, although, these policies concern their lives to greater extend and the following prove the exclusion of peasants from the process participation:

a. The long term experience of Local people in agriculture is neglected by the government intervention policies and this prohibited natural development of agricultural policies basing the ground of local experience.
b. participation of stakeholders as crucial elements in project management was neglected by intervention policies.
c. Agricultural intervention policies ignored training activities and extension facilities to the local peasants.
d. objectives of agricultural production of the authorities responsible for agricultural policies and that of the farmers are contradicting

d. Peasants' voice is not heard by the authorities and consequently their demands and problems remain without care. This is because peasants do not have democratically elected representative body.

3. Table 4.13.1 and 4.13.2 illustrate that the value of Chi square test of the third axes is (2.776E2c) at degree of freedom 14 , and level of significance (0.000) which is less than p-value ($\alpha = 0.05$) ,Therefore, we can accept the argument null hypothesis (no significant differences between the expected frequencies and observed duplicates) which means that majority of the sample study agree with the statements of the hypothesis " Agricultural intervention policies leaded to the erosion of farmers capacities to the extent that food provision has become one

of their main difficulties " this is because the values of the mean is (4.0738) on the five-level Likert scale bases.

So and basing on the above mentioned, the study finds that agricultural intervention policies in the area of Nuba Mountains leaded to the erosion of the local peasants abilities to the extent that food provision has become one of their main difficulties and the following prove that:

a. Most fertile land is dominated by the already better off outsiders, while local peasants remain restricted to the less fertile land near the foot of the hills and gurdud lands and this affected their production to decline.
b. Pastoralists lost access to their natural pastures due to new process of land demarcation.
c. Of the main function of Agric Bank is the development of agricultural production through crediting farmers, particularly, small farmers. But, regulations, and credit guarantee conditions favor big farmers and small farmers receive only insignificant portion of credit loan. Moreover, financial institutions are not dispersed in the remote areas where peasants leave.
d. The technology of production is still traditional, although appropriate intervention agricultural policies always encourage fast technological change and investments to enable small farmers benefit from the advanced technological potentials available in the world.
e. In good seasons some of the production is spoiled non-economically because of the lack storage facilities.

4.Table 4.14.1 and 4.14.2 illustrate that the value of Chi square test of the fourth axes is (1.330E3d),degree of freedom 10 , and level of significance (0.000) which is less than p-value ($\alpha = 0.05$) and therefore we can accept the argument null hypothesis (no differences significantly between the expected frequencies and observed duplicates) which

means that majority of the sample study agree with the statements of the hypothesis " lack of investment in human resource and the infrastructure development leads to the lack of necessary tools for sustainable development " this is because the values of the mean (4.7390) on the five-level Likert scale bases.

So and basing on the above mentioned, the study finds that investments in human resource developments and the infrastructure will give small farmers necessary tools for sustainable development and the following ensure that:

a. Provision of drinking water facilities, for both man and animal, near the productive areas will help in the increase of production. The time and effort that expend on bringing water from the remote areas can be saved for the benefit of on farm activities. Also, near water facilities decreases water prices and augment farmer's incomes.
b. Increasing access to health facilities to farmers of the area through building health facility centers near their dwellings increases production and consequently their income will increase. Normally, healthy people produce more than unhealthy one. Some studies in Gezira scheme indicated that malaria disease is one of the causes of productivity decline. All of this indicates that health is crucial element in production economies.
c. Roads are important instruments for development. An easy road reduces production costs and commodity prices. Therefore, feeder roads should be improved across the region to connect the widely dispersed peasants over remote villages.
d. Markets across the area of the Nuba Mountains need improvements a lot of unfair deals are committed in these markets and peasants always are the losing party.
e. Education and training increase knowledge and skills to farmers,

which enable them manage their assets and invest their resources in good manner.

5.Table 4.14.1 and 4.14.2 illustrate that the value of Chi square test of the fifth axes is (3.518E2e),degree of freedom is 13, and level of significance (0.000) which is less than p-value (α = 0.05) . Therefore, we can accept the argument null hypothesis (no significant differences between the expected frequencies and observed duplicates) which means that majority of the sample study agree with the statements of the hypothesis " local farmers have put in a poverty trap by agricultural intervention policies " this is because the values of the mean (4.1800) on the five-level Likert scale bases.

So , basing on the above, the study finds that agricultural intervention policies have put local producers and small farmers in poverty trap and the following prove that:

a. Depending on one source of living i.e. agriculture, increases chances for peasants to remain poor .
b. Production and productivity rates of peasants are annually deteriorating, which means inability of people to expand production.
c. Relief food distribution to the people including farmers is common across the region.
d. Comprehensive reforms are required to enable peasants invest on their resources. For instance, peasants need land reforms and tenure to use their land for farm production and investment improvement.
e. Food insecurity is facing Peasants of the area.

6. Table 4.14.1 and 4.14.2 illustrate that the value of Chi square test of the sixth axes is (520.160f) at degree of freedom 11, and level of significance (0.000) which is less than p-value (α = 0.05). Therefore, we can accept the argument null hypothesis (no differences significantly

between the expected frequencies and observed duplicates) which means that majority of the sample study agree with the statements of the hypothesis " Small farmers could not expand production, unless, they are empowered." this is because the values of the mean is (4.5840) on the five-level Likert scale bases.

So and basing on the above mentioned, the study find that small farmers could not expand their production, unless, they empowered and their capacities are developed and the following proves that:

a. Any productive work, particularly, agricultural requires smart participatory principles which determine and coordinate clearly the interests of each party. Contradicting interests hinder performance and slow the growth rates.
b. Redistribution of big schemes pro-local communities enables small farmers practice shifting cultivation which proved to produce high production.
c. Institutional reforms through changing laws and regulations at both national and local levels allow local people dominate their local resources.
d. Problems of agriculture and that of the peasants will remain without solution whenever representative body of peasants, who is democratically elected, is exist. Voice of peasants must reach the authorities. Authorities must be responsive to the voice which expresses demands and claims of the peasants, also authorities must be accountable to peoples representatives, who are elected freely by small farmers.
e. Local experience of peasants must be recognized for effective participatory project.

7. Table 4.14.1and 4.14.2 illustrate that the value of Chi square test of the seventh axes is (4.346E2a) at degree of freedom 16, and level of significance (0.000) which is less than p-value ($\alpha = 0.05$). Therefore, we

accept the argument null hypothesis (no significant differences between the expected frequencies and observed) which means that most of the sample study agree with the statements of the hypothesis " deteriorations in food production in the area is responsibility of agricultural intervention policies " this is because the values of the mean is (4.1521) on the five-level Likert scale bases.

Accordingly, the study finds that agricultural intervention policies are responsible for the deteriorations of food production in the Nuba Mountains and the following prove that:

a. Small farmers started to sell their labor to big scheme owners to meet urgent need of cash instead of spending full hour labor time on their farms which are principally devoted to food crops
b. Family labor is fragmented and dispersed into individual wage labor for cash, emigrants, and school attendants.
c. Colonial administrative arrangements were behind the wide spread transformation of the local farmers from subsistence farmers into cash crops producers mainly cotton.
d. Cotton production was at the expense food production. Those who used to produce food crop cut down some effort and time and directed it to cotton production.
e. 'Dekenya' tax was one of the tools used by the colonial administration to push the Nuba peasants grow cotton beside stable crop.
f. Although cotton production is economically feasible, the immediate cash payment upon delivery makes local farmers to grow it and come to halt when farmers discovered other sources of cash

4. 15 Results of the qualitative data analysis:

From the test of the study axes and the study hypotheses, the study reaches findings which support the hypotheses of the study as follows:

- Local resources are not benefiting local people of the area, on the contrary, they benefiting traders, originally, from north of the Sudan.
- Intervention agricultural policies in the area have eroded the capacities of the local farmers to the extent that food provision has become one of their main difficulties, those whose is main function is food production are food insecure.
- Local people do not participate in setting or formulating agricultural policies, although they are affecting their lives.
- Lack of development in infrastructure and human development resulted in the lack of necessary tools for sustainable development.
- Local people, particularly, small farmers are in poverty trap since they exposed to these inadequate government intervention policies.
- Farmers have lost capabilities to increase production and any further increase in production is not attainable possible, unless, farmers are empowered.
- Spread of food insecurity among farming households.

4.16 Conclusions:

The notion which led government to intervene in the agriculture of the Nuba Mountains was the development of the backward societies of the area. This has to be done through the utilization of the huge agricultural resources of the area. Accordingly, a number of agricultural development policies were made by the authorities to organize agricultural activities to achieve the goal of developing local people. In the context many agricultural projects were established. Projects such as; cotton production, mechanized rain fed and modernization schemes. All these schemes ended in nothing feasible and good for the local farmers. The expected transformation of their life did not happen. On

the contrary, their life is deteriorated more than ever before.

So, this study intends to find out whether agricultural development policies empowered local farmers, through enhancing their living conditions, or not. Also, the study seeks to launch new approach of development in the area as an alternative development approach known as Empowerment Approach. So, the study assess development agricultural policies, as problem of the study, in the context of empowerment approach to development. The study suggested several hypotheses to stand behind the difficulty of the life facing the people of the area. But the most prominent hypothesis is that development re inadequate to empower local farmers of the area. The followed descriptive and analytical methodology processing questionnaire as main tool of data collection. Data e processed using SPSS for the quantitative data, and five-likert measurement for the qualitative data. Several results supporting hypotheses . for instance, despite improvement in educational opportunities, many of school age are not attending school, beside wide spread illiteracy among the old age group, and female education is moving solely behind the male education. Also, every given household in the area has witnessed at least one infant mortality. Moreover, food poverty has become annually striking farming households. These results indicates that local farmers, lack range of assets and capabilities. Therefore, their life is vulnerable and fragile . Assets can help them with stand economic shocks, capabilities help them manage their resources in proper manner. Consequently, the study calls for the adoption of empowerment approach to develop societies of this area. Because empowerment approach can enable local farmers to expand assets and capabilities. Therefore, the study recommends that authorities should provide ample public services to the area, and enable people to have access to these services through empowered local governance. Also, introduce and develop small scale agro-industry in rural areas, and establish micro branches of formal financial credit

institutions at village level. Finally, the study proposes some future studies for holistic solutions of the problems of local farmers in the area of the Nuba Mountains.

4.17 Recommendations:

The study recommends the following:

1. Provision of basic services:

Authorities must recognize the critical role of sustainable basic services in the life of people and then urgently provide them to all including small farmers in the remote areas. These basic services include: health care facilities, education, water, roads, and basic infrastructure.

To improve access and functioning of these basic services authorities must empower local people through mechanisms that intend directly to:

a. Increase access of information of people about the available basic services. This because informed people always react positively towards these basic services.
b. Enable inclusion and participation of people at the grassroots. Sometimes basic services are isolated islands, poor people cannot opt in. Therefore, poor people must get involve in these basic services and have feeling of belonging through widening access to these basic services.
c. Improve local organizational capacity. Involvements of local communities in managerial practices of these basic services enable them acquire more skills and knowledge which will help them in effective and efficient participation.

2- Empower local government with authorities and resources:

Improved local governance is critical to better service provision and greater responsiveness to poor people's priority problem. So, empowered local government with authority and resources can

empower local communities. Therefore, the following must be made to empower local government:

a. Establish and complete local government institutions and levels.
b. Provide local government institutions and the levels with ample authority and financial resources.
c. Introduction and adoption of rule of law and as behavior in local government institutions.

Therefore, authorities must establish good local governance that relies on the rule of law and ample resources.

3-. Revision of policies at national governance level:

Of course, improving local governance is not enough to improve poor people's livelihood. Some processes and policies at national governance level, like law of land tenure system, affect, negatively, access of poor local people to economic resources and opportunities. Therefore, it is critical to revise these processes and policies to guarantee harmony between national and local government levels policies and procedures aiming at improving life of the poor through the following:

a. Provision of individual security rights over land.
b. Reform the present land tenure system.

Redistribution of individual big schemes into small farms.

4. Pro-poor markets development:

Poor people are often excluded from access to economic opportunity because of regulations, discrimination, and lack of information, connections, skills, credit, and organizational behaviors. This, usually prevents poor people from entering markets and makes economic use of these markets. If poor people excluded from the optimal productive activities, then economic growth cannot sustain, therefore, it is necessary to remove and overcome constraints that hinder poor farmers to enter markets with good bargaining power through:

a. Increasing financial access to farmers.
b. Managing vulnerability of small farmers through insurance and housing access.

Provision of storage facilities to small farmers.

5. Access to justice and legal aid:

As well as investment climate needs rule of law and functioning judicial system, poor people also need rule of law and effective judicial system to protect them from violations. Legal reforms in this respect can create sound environment for good governance and empower people by increasing their access to justice through the following:

a. Improving administrative justice and making administrative decisions accountable and affordable to ordinary people.
b. Promoting judicial independence and accountability.
c. Improving legal education.
d. Improving poor people's cultural, physical, and financial access to justice.
e. Public outreach services and educational opportunities.

6. Introduction and development of small scale agro-industry in rural areas:

Agro-industry is the only way to improve the welfare of farmers while attaining overall economic growth. It is a rural based with business characteristics agro-industry concerned with processing agricultural products of raw materials and it can function the following:

a. Promote agricultural growth through increasing demand of agricultural processed products.
b. Accelerate economic development while improving income distribution among farmers.
c. Provide productive employment for the rapidly growing rural labor.

d. Alleviate rural unemployment by absorbing it in the labor intensive agro-industry firms.
e. Agro-industry ensures food security and improves purchasing power of the farmers to other goods.
f. Agro-industry increases farmer's income through the value added generated by agro-industry.

7. Establishment of micro-branches of formal financial credit institutions at village level to achieve the following:

a. Make small farmers get, easily, the necessary information about credit and its regulations.
b. Introduce credit facilities to the small farmers at village level.
c. Collect production surpluses from farmers who own surplus production to form local capital for farm investments.
d. Ensure mutual communications between farmers and the credit institutions to promote credit loans.
e. Combat the exploitive role of the informal money lender among farmers.
f. Inclusion and participation of rural small farmers in formulating policies of the credit institutions.
g. extend the date of loan repayment to the end of the season to enable farmers sell their crops at appropriate date when the prices are high.

4.18 Future studies

Based on the study results, the study proposes future studies, to complete scenario of this study through holistic treatment to the problem of economic difficulty facing small farmers in the Nuba Mountains. These areas are as follows:

a. How inequality of land distribution affect the production of small farmers and how land reform can contribute in expanding production of these small farmers.

b. An appraisal of the experience of the increasing role of hired labor in the farms of small holders, whether it is cost-effective?
c. Feasibility of reconciling benefits between farmers and the formal credit institutions through changing the date of selling crops and that of loan repayment.

ENGLISH REFERENCES

A. Books:

1. Abdel Gabar (1997), Mechanized farming and the Nuba Peasants: An example of non-sustainable development in the Sudan, Hamburg.
2. Casley/Kumar (1990), Project monitoring and Evaluation in Agriculture, the Johns Hopkins University Press, Baltimore, Maryland.
3. David Lehmann(1979), Development Theory ؛ Four Critical Studies, England, London , Frank class and company limited.
4. Deborah Eade (1997), Capacity-Building ; an approach to people – centered Development, Oxfam cuk & Ireland).
5. Deepa Narayan (2002), Empowerment and Poverty Reduction; The world Bank ,Washington , DC.
6. ElBattahani (2009), Nationalism and peasant politics in the Nuba Mountains Region of Sudan, 1924-1966, Khartoum University press.
7. J . D, Tothill, C.M.G, DSC, B.SA(1948), Agriculture in the Sudan, London, Oxford University Press.
8. Jeffrey D, Sachs (2005), The end of Poverty ; Economic Possibilities for our Times, pen, penguin press.
9. John FriedMann(1992), Empowerment , USA, Black well Publisher INC.

10. Khalid Affan (1984), Towards an appraisal of tractorization experience in the rain lands of the Sudan, Development Studies and research centre ,Faculty of Economics and Social Studies, University of Khartoum, monograph series No.16.
11. Linda Swalling Fetting (2007), The ABCs of Development. It's about Building Capacity, USA Author House.
12. Michael P. Todaro, Stephen C. Smith(2003), Economic Development, (eight edition) England, Person Education limited.
13. Nadel, S F.(1947) ,The Nuba ; An anthropological Study of the Hill Tribes in Kordofan , Oxford University press.
14. Nora Dud Wick, Karin Fock, David Sedik (2007), Land Reform and Farm Restructuring in Transition Countries; the experience of Bulgaria, Moldova, Azerbaijan, and Kazakhstan, World Bank Washington, Dc.
15. Sen, Inequality Re-examined, Harvard University press 1995.
16. ThirWall, (1997) Growth and Development in Underdeveloped Areas, UK, London, Macmilland press LTD.
17. Medani Mohamed.M Ahemd (1993), Development of Agriculture in the Sudan, Sudan, Khartoum University Press.
18. G.M. Craig, (1991) The Agriculture of the Sudan, Oxford University Press.
19. Rural Poverty Report, (2010), International Fund for Agricultural Development(IFAD).

B. Unpublished Researches

1. Alfred Ambo Simon(2005), The role of Federalism in the social services and Development; an ex-post evaluation of southern Kordofan State, unpublished thesis submitted for the fulfillment of PhD degree in Public Administration, Al nilein University.
2. Takola (2003), Peasants households food insecurity in the Nuba Mountains, Dissertation submitted in partial fulfillment of the

requirement for the award of MSc degree in development planning, University of Khartoum.

c. Internet

1. http// www. Investopedia.com.
2. http//www.nationsencyclopedia:com/economies/Africa/Sudan.

(1)المصادر العربية:

1. البطحاني (2006) ، الاقتصاد السوداني ، فترة ما بعد الحرب، اقتصاد السوق والتنمية البديلة، الخرطوم.
2. حسين سليمان محمد أحمد(2011) ، الفقر والتنمية الريفية في السودان ، مطبعة جامعة الخرطوم.
3. عثمان إبراهيم السيد(2003) ، الاقتصاد السوداني ، دار جامعة القرآن الكريم للطباعة ، الطبعة الثانية.
4. عوض إبراهيم عبد الرحمن الحفيان(1995) ،أسس التنمية الريفية و دور الزراعة في السودان ، مطبعة جامعة الخرطوم.

(2) المجلات و الدوريات العلمية

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