بسم الله الرحمن الرحيم

Sudan University of Science and Technology
**College of Graduate Studies**

# Assessment of the Impact of the European Union and African Caribbean and Pacific Countries Economic Partnership Agreement on Agricultural Trade of the Sudan with Special Reference to Major Export Crops

# تقييم أثر اتفاقية الشراكه الاقتصادية بين الاتحاد الأوربي والدول الافريقية والكاريبية والباسيفيكية على التجارة الزراعية للسودان مع إشارة خاصة إلى صادرات المحاصيل الرئيسية.

A Thesis Submitted to Fulfillment of the Requirements
For the Degree of Doctoral of Philosophy (Ph.D.)
In Agricultural Economics

By
**Azhari Ibrahim Dowina Mousa**
B.Sc. (Agric.) Honors
Sudan University of Science and Technology, December (2005)
M.Sc. (Agric. Economics),
University of Khartoum, September (2010)

Supervisor
**Dr. Mohammed Ahmed Osman Ibnouf**

Co-Supervisor
**Prof. Hag Hamed Abdel Aziz**

October, 2019

**DEDICATION**

*To my father soul*

*To my mother*

*To my brothers and sisters*

*To my friends*

*Azhari*

# ACKNOWLEDGEMENTS

First of all I want to express my deepest thanks to Allah who helped me to finish this work in spite of all the difficulties involved in performing it work. This study owes a great deal to many people and institutions with all respect. I would like to express my deep thanks and gratitude to my supervisor Dr. Mohammed Ahmed Osman Ibnouf for his guidance, hospitality, support, comments, suggestions and encouragements throughout the study period. I would like to express my deep thanks and gratitude to my co-supervisor Prof. Hag Hammed Abdel Aziz for his comprehensive guidance valuable support and comments. My deep gratitude to my friend Dr. Mohammed Abdellah Teabin for his kind help. Sincere appreciation is due to the staff of the Department of Agricultural Economics, Ministry of Agriculture and Forestry, the Central Bank of Sudan, Sudan Custom, Ministry of Foreign Trade, and Department of the Economic Partnership Agreement. My thanks are also due to the staff and colleagues in the Department of Agricultural Economics, Faculty of Agriculture, University of Khartoum. My thanks are also due to the staff of the Department of Agricultural Economics, Sudan University of science and technology for their kind help. I would like to express my sincere gratitude to all those who helped me to finish this work successfully. This study owes a great deal to many people and institutions with all respect. I would like to express my deep thanks and gratitude to my supervisor Dr. Imad Eldin El Fadel for his guidance, hospitality, support, comments, suggestions and encouragements throughout the study period. At last but not least my deepest thanks to my family members, mother, brothers and sisters.

# TABLE OF CONTENTS

# LIST OF TABLES

# LIST OF FIGURES

# LIST OF ACRONYMS

| | |
|---|---|
| ACP | African, Caribbean and Pacific Countries |
| CARIFORUM | Forum of the Caribbean Group of ACP States |
| CBS | Central Bank of Sudan |
| CES | Constant Elasticity of Substitutions |
| CET | Constant Elasticity of Transformations |
| CPA | Colum Partnership Agreement |
| CS | Consumer Surplus |
| CU | Customs Unions |
| EBA | Everything But Arms |
| EC | European Commission |
| ECDPM | European Center for Development Policy Management |
| EPA | Economic Partnership Agreement |
| ESA | Eastern and Southern African Countries |
| EU | European Union |
| FAO | Food Agriculture Organization |
| FIA | Free Trade Area |
| GATT | General Agreement on Tariff and Trade |
| GDP | Gross Domestic Product |
| GSP | Generalized System of Preference |
| IMF | International Monetary Fund |
| LDCs | Least Developed countries |
| Lomé | Capital of Togo, first Lomé convention signed 28 February 1975 between EU and ACP Countries |
| MDG | Millennium Development Goals |
| MFN | Most Favored Nation |
| NAFDAC | National Agency for Food and Drugs Administration and Control |
| NAFTA | North American Free Trade Agreement |
| OXFAM | Oxford Committee for Famines Relief or Committee Non-Profit Organization |
| PS | Producer Surplus |
| ROO | Rule of Origin |
| SADC | Southern African Development Community |
| SANCO | South African National Civil Organization |
| STABEX | System for the Stabilization of Agricultural Export Earnings |
| TR | Tariff Revenue |
| TVC | Total Variable Costs |
| UNCTAD | United Nations Conference of Trade and Development |
| WTO | World Trade Organization |

# ABSTRACT

The purpose of this study was to assess and evaluate the potential impact and implications of Economic Partnership Agreement (EPA) between Sudan and the European Union (EU) on the performance of its agricultural trade. The study depended on secondary data obtained from the Ministry of Agriculture and Forestry, Department of EPA, Ministry of Foreign Trade, Central Bank of the Sudan, Statistics Directorate and other relevant sources. The Armington model was used to estimate the potential impacts and implications of the EPA on the Sudan agricultural trade. The model used zero tariffs scenario (S1) to realize the objectives of the study and impacts of the implementation of the EPA on domestic production, consumer prices, producer prices, producer surplus, consumer surplus, and net welfare. The results showed that the application of the EPA have positive impacts on producer and domestic agricultural production, and have a negative impact on the domestic consumption and consumer prices. Also, the EPA implementation showed an improvement in the producer surplus, consumer surplus and net welfare. The study results showed that application of the EPA has positive impacts on Sudan's agricultural output, exports and foreign exchange earnings. Also, the implementation of the EPA will redirect agricultural exports of the Sudan towards the EU markets, rather than the rest of the world. Sudan needs to look at any expected negative impacts of the EPA on the domestic markets. The study concluded that the Sudan need to pay attention to the implementation of the EPA in order to encourage trade integration of its market with the EU and to benefit from the potential growth of its trade with EU markets.

## المستخلص

هدفت هذه الدراسة إلى تقويم وتقدير تأثير وانعكاسات إتفاقية الشراكة الاقتصادية بين السودان والاتحاد الأوربي على عمل تجارة القطاع الزراعي . استخدمت الدراسة بيانات ومعلومات ثانوية جمعت من وزارة الزراعة والغابات، قسم الشراكة الاقتصادية، وزارة التجاره الخارجيه، بنك السودان المركزي، والإدارة العامة للإحصاء ومصادر أخرى ذات صلة. استخدمت الدراسة نموذج أرمنتوج لتقدير تأثير ونتائج اتفاقية الشراكة الاقتصادية على تجارة القطاع الزراعي السوداني. كما استخدمت الدراسة سيناريو التعريفة الجمركية الصفرية (S1) لتحقيق اهدهف الدراسه وتأثير تطبيق اتفاقية الشراكه الاقتصاديه على الإنتاج المحلي وأسعار المنتجين واسعار المستهلكين، فائض المنتج، فائض المستهلك، والرفاه العام. اظهرت نتائج الدراسة أن تطبيق اتفاقية الشراكه الاقتصاديه لها تأثير إيجابي على المنتج والإنتاج الزراعي المحلي، وتأثير سلبي على الاستهلاك المحلي واسعار المستهلك. كما أظهرت أن هناك تحسناً في فائض المنتج وفائض المستهلك والرفاه العام .كما اظهرت الدراسه ان تطبيق اتفاقية الشراكه الاقتصاديه له تاثير ايجابي علي الانتاج الزراعي السوداني والصادرات وعلي عائدات النقد الاجنبي. ذلك تحسن في رفاهية المنتجين والمستهلكيين والرفاه العام. كما اظهرت نتائج الدراسه ان تطبيق اتفاقية الشراكه الاقتصاديه له تاثير ايجابي علي منتجات السودان الزراعيه والصادرات وعائدات النقد الاجنبي. ايضا، ان تطبيق اتفاقية الشراكه الاقتصاديه يعمل علي اعادة صادرات السودان الزراعيه الي المقدمه في اسواق الاتحاد الاوربي مقارنه بدول العالم الاخري . يحتاج السودان للنظر الي التاثير السلبي لاتفاقية الشراكه الاقتصاديه في الاسواق المحليه. وخلصت الدراسة إلى أن السودان يحتاج مزيداً من الاهتمام بهذه الإتفاقية لتشجيع التكامل التجاري بين الأسواق مع الاتحاد الاوربي والاسستفادة من امكانات النمو التجاري مع اسواق الاتحاد الاوربي .

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background

Trade Agreements between the European Union (EU) and the African, Caribbean, and Pacific countries (ACP) started in 1963 when six EU countries and 18 ACP countries signed Yaoundé I Agreement, followed by Yaoundé II in 1969 and Yaoundé III in 1973. In 1975 they signed Lomé I Agreement followed by Lomé II in 1980 and Lomé III in 1985 and Lomé IV in 1990. In 2000 they signed Cotonou Agreement. The trade agreements between the EU and ACP countries started by relatively few countries in 1963, but in 2007, 27 European countries and 79 ACP countries were involved in the cooperation. Lomé Agreements I, II and III concentrated on the economic cooperation, but in Lomé IV and Cotonou Agreements, human rights, democracy and governance, implementation of law and other political issues were added to the agreements (Ministry of Foreign Trade, Sudan 2008).

During (1975-2000) period, the ACP countries benefited from non-reciprocal preferential trade agreement with the EU. In the mid-1990s, the EU initiated a revision of their cooperation with the ACP countries in order to adapt the framework of these relations to the new global contexts, globalization, poverty reduction and sustainable development. This trade cooperation, as per article 1 of the Lomé convention, was designed to be implemented taking into account the respective levels of development of ACP countries. In particular the

need to secure additional benefits to the ACP countries, in order to accelerate the rate of growth of their trade and improve the access of their products to the EU market.

The CPA countries and the EU during the period starting from 2000 and ending in 2007 negotiated the Economics Partnership Agreement (EPA) as the new framework for their economic and trade cooperation. The primary aim of this cooperation is to contribute to the development of trade regime that promotes sustainable development and the integration of ACP countries into the world-economy.

Sudan was involved in the EPA negotiations with EU within the Eastern and Southern Africa (ESA) regional economic community (Ben Hammouda *et al*., 2006). The central objective of the partnership is clearly indicated in articles 1 and 2 of the first chapter of the ACP-EU Partnership Agreement. The main objective of the partnership is to reduce and eventually eradicate poverty while contributing to sustainable development and to gradual integration of ACP countries in the world economy. The EPA defines the new cooperation frame-work between the ACP countries and the EU to be in place for 20 years. The key principles of the CPA are reciprocity, differentiation, deeper regional integration and coordination of trade and aid. As a result of EPA agreement the ACP countries will have to reciprocate on their tariffs on exports from EU, as a counterpart of the duty free access to their exports enjoyed in European markets.

## 1.2 Problem Statement

A number of African countries have put in place structures aimed at diversifying their economies and increase their foreign trade earnings. One of the reasons given for the marginalization of African countries in global trade is the limitation imposed by their undiversified exports. The EU is the main trading partner for the majority of the ACP countries, especially in Africa. That is why the current reforms of agricultural policies, such as the regional integration processes, the EPA, and agricultural negotiations within the World Trade Organization (WTO), are important for the ACP countries (ECDPM, 2008).

Two major problems can be seen concerning the agricultural trade of the ACP countries which are also the main issues at stake in their agricultural trade negotiations. The first one is access to the markets in developed countries and the EU in particular, and the second is the competition of imports from developed countries on ACP national markets, which may create problems for domestic producers (ECDPM, 2008).

Based on the EPA the ACP countries will be affected by the elimination of tariff, and barriers on imports from the EU. The loss of revenues due to the elimination of tariffs represents a challenge to ACP countries that they need to resolve to be able to give reciprocal performances to the EU. The ACP countries are to a large extent dependent on customs duties for their budgets resources Sudan is not an expectation. In some of ACP countries like Sudan dependency on customs duties results from both the slow development of fiscal administration, and weak fiscal development. Agricultural trade is very important for the ACP countries,

practically all African countries. Agriculture is a vital sector for the ACP countries, as it's the main source of foreign currency for most of them and the majority of the population (between 40 and 90%) depend directly on it for their subsistence (ECDPM, 2008).

Sudan economy is based largely on agriculture as a source of non-petroleum foreign exchange earnings, raw material for the industrial sector, and sources of food for its inhabitants. Moreover, it is a source of services produced by other sectors, as well as a source of employment to more than two thirds of the labor force in the country. Sudan depends greatly on foreign exchange earnings from agriculture for its internal and external financial balance. Accordingly, Sudan needs to be aware of certain challenges that will be imposed on its economy by the implementations of the EPA with the EU. These challenges may include issues such as the management of the expected losses of fiscal revenue, adaptation to the expected increase in the competition related to the principle of reciprocity included in the EPA, the evaluation of the net benefits from the EPAs. The differences in productivity and competitiveness between the ACP countries and EU are amplified by the considerable public support from which European agriculture benefits. Agricultural producers may not be able to compete with EU producers given the substantial domestic support and export subsidies provided by the EU to the agricultural sector (Ministry of Foreign Trade, Sudan, 2008).

Trade plays an important role in Sudan economy. Sudan implemented different development strategies and various reform programs that targeted the increase of exports of agricultural commodities which are

the main non-petroleum exports. Liberalization and privatization policies are the main instruments adopted to enhance production and export of agricultural products and economic growth (Ministry of Agricultural and Forestry, Sudan 2008).

The European Commission (2005) stated that, the EPA may create conditions for trade and investment for ACP countries. Together with development aids, that can deliver a number of benefits for the ACP countries, more markets, and more sales by opening the EU markets. In addition a better infrastructure, administrations and public services to increase and improve productive capacity and trading opportunities and knowledge transfer. ACP countries may also benefit from EPA and EU more transparency, political and economic stability. The study will explore the potential impact of such issues on the Sudan.

EPA may provide many benefits for farmers (producers) and manufactories in ACP countries as part of the development dimensions of the agreement. EPA don't just create opportunities for trade in goods but for dealing with others issues relating to development too, because the trade and development go hand in hand, no quotas, no duties on exports to the EU markets, of half billion people for all ACP products. ACP consumers may benefit from EPA through lower prices, removing trade barriers for products from EU. Many small-scale, family-run businesses in the ACP countries may benefits from being able to sell their products in the EU markets (European Commission, 2005). Consequently, governments of the ACP member countries, including Sudan, should pay more attention to EPA to encourage economic trade integration on their markets to benefits from

the potential of trade between them and EU. The study intends to look and analyze the above raised agricultural trade issues and estimate and assess the potential implications of signing of the Economic Partnership Agreement (EPA) on the agricultural trade of Sudan.

## 1.3 Objectives of the Study

The general objective of this study is to assess the potential implications and the impact of signing the Economic Partnership Agreement (EPA) with EU on the Sudan agricultural trade relationship. Specifically the study will intend:

1. To describe the Economic Partnership Agreement (EPA) and Sudan current status as regard to the agreement.
2. To estimate the EPA effects especially on agricultural trade exports of specific of the Sudan with the EU and the rest of the world.
3. To estimate the potentials impact of EPA on domestic production and consumption of agricultural commodities of the Sudan.
4. To estimate the potentials impact of EPA on producer surplus, consumer surplus and net welfare of agricultural production of Sudan.
5. To draw from the study some policy recommendations for the Sudan to deal with EPA implications, and suggest some areas for future research.

## 1.4 Research Hypotheses

1. Impacts of Economic Partnership Agreement on domestic agricultural production are positive impacts, and impacts on consumption are

negative, due to increase in aggregate output of the agricultural production and improvement in foreign exchange earnings.

2. Application of the zero tariffs by the EU on agricultural commodities for the Sudan will increase trade benefits of the Sudan.

3. Domestic producer's surplus and consumer's surplus and net welfare for the Sudan will improve, due to the implementation of EPA with the EU.

## 1.5 Research Methodology

### 1.5.1 Data collections

To achieve the objectives of the study, secondary data was collected for production, domestic consumption, and trade of the four major export crops of the Sudan. The major export crops of the Sudan are cotton, sesame, gum Arabic, and groundnut. Data collected for these crops covered the period from 2004-2014. The period of 2004-2014 was chosen as it represents the only complete available data up to year 2018. Data collected was first used to describe the current situation of the production, domestic consumption and trade of the selected crops. The average production, domestic consumption, exports, and prices for the major export crops during the period 2004-2014 was used to represent the base year for the analysis after signing the EPA by the Sudan, for more details see chapter three.

### 1.5.2 Analytical techniques

The first objective of the study was to describe the production, domestic consumption, and trade of the four major export crops cotton, sesame, gum Arabic, and groundnut during the period 2004-2014. To see the performance of the four major export crops during 2004-2014 descriptive statistics was used. The Statistical Package for Social Scientist (SPSS) was used to analyze the situation before signing the EPA.

To see the impact of signing EPA objectives between Sudan and EU Armington model was used. The model was built in Microsoft Excel Program. Armington model is a useful tool in analyzing a number of various agricultural and international trade issues. The model has many important characteristics and advantages for example it introduces products differentiation and gains from trade in consuming differentiated products. It also makes it possible to use aggregated trade data. The Armington model assumes that final goods internationally traded are differentiated on the basis of the country of origin. The general nature of the Armington model allows for simultaneous determination of supply, demand, producer and consumers surplus, welfare, for all commodity under the study. The study covered the most important agricultural exports to the EU markets namely, gum Arabic, sesame, cotton and groundnuts. For more details about the Armington model see chapter three.

## 1.6 Organization of the Study

The study is composed of five chapters, Chapter one is introduction of the study (problem statement and, objectives and research methodology and organization of the study). Chapter two deals with literature review and

theoretical context of the Economic Partnership Agreement between the EU and ACP countries. Chapter three deals with methodology and framework of analysis. Chapter four deals with results and discussion. Chapter five represents the summary, conclusion and recommendations of the study.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Theoretical context of the economic partnership agreements between the EU and ACP countries

Economic relations between the developed and under-developed countries have been a subject of varying theoretical postures between those who viewed the relationship as beneficial and reinforcing and those who conceive such relationships as essentially asymmetric and predatory. While the former reflects the position of liberal economists, the latter reflects those of realists, Marxists, and structuralisms. Implicit in both arguments, though, is the consensus that politics is at the root of economic relations between developed and undeveloped nations (Gilpin, 2000).

In the post-world war 11, liberalism, especially as embodied in classical and neo-classical economics has been the dominant theory of the prevailing international economic system (Speroand Hart, 2010). Following David Ricardo's laws of comparative advantage, liberalism and its other variants of neo liberal ideologies argued and continue to argue that free trade and complete openness or liberalization of domestic economies hold the key to economic development (Meier, 1984;Bhagwati, 1985). On their own part, Sachs and Warners (1995), in their celebrated studies of openness and growth, presented empirical evidence of appositive correlation between economic growth and openness. From the perspectives of these authors, over the past fifty years, countries that have done well, economically, are those like then newly industrializing countries of South East Asia that have pursued export led industrialization. In view of such evidence, they argue

that countries that remain at the fringes of globalization like those found in the sub-Saharan Africa should follow the example of these globalizes (Sachs and Warners, 1995).

The liberal theory of economic growth also contends that the major hindrances to economic development in the third world countries are caused by domestic economic policies, which create or accentuate market imperfections, reduce the productivity of land, labor and capital, and intensify social and political rigidities. Added to these problems are the traditional nature of the societies in the third world, lack of savings and investments, lack of the right attitude to work and in particular, the fact of the imperative of having to pass through stages of economic growth. This is the argument of the modernization theory (Rostow, 1960).

The neo-liberal theory of economic growth is also anchored on the idea that specializations in areas where factors of production are relatively abundant promotes more efficient resource allocation and enable economic actors to apply their technological and managerial skills more effectively. Ital so encourages higher levels of capital formation through the domestic financial system and increased inflow of foreign direct investment (Spero, 2010; Rostow, 1990). This theory recommends the adoption of policies that increase domestic level of competition, through the privatization of state enterprises, deregulation of regulated markets, liberalization of trade and exchange rate and other domestic reforms under what is known as Washington Consensus (Williamson, 1990).

The fall of the Berlin Wall, the end of the cold war, and the opening up of the economies of former socialist states of Eastern Europe, the export drive of China and India accelerated the globalization of the neo liberal

ideals all over the world. The proponents of this theory remain convinced that free trade will further increase worldwide prosperity, irrespective of the historical and peculiar conditions of the particular countries. The doctrine also sees market exchange as an ethic in itself, which is capable of acting as a guide for all human actions. The campaign for the establishment and sustainability of this global neo-liberal order draws support from the intellectual, business and political elites as well as international institutions of the North such as the US Treasury, IMF, the World Bank and scholars whose researches are essentially geared towards the sustenance of this order. This also includes the right wing media organizations like the Washington Post, The Economist and a host of others (Harvey, 2007).

The central assumption of neo-liberalism is to privilege the market above the state in the necessary functions of fostering economic development. The free trade theory also sees trade as an important stimulator of economic growth as it helps to enlarge a country's consumption capacity, increases world output and provides access to scarce resources and worldwide markets for products without which poor countries would be unable to grow. It goes further to state that trade tends to promote greater international and domestic equality by equalizing factor prices, raising real incomes of trading countries and making use of each nation's and the world's resources endowment (e.g. by raising relative wages in labor abundant countries and lowering them in labor scarce countries) (Todaro and Smith, 2008).

In sum, the argument of free trade is that in a world of free trade international prices and costs of production determine how much a country should trade in order to maximize its national welfare. Proponents of free

trade argue that countries should follow the dictates of the principle of comparative advantage and not to interfere with the free working of market. In all cases, self-reliance based on partial or complete isolation is asserted to be economically inferior to a world of unlimited free trade (Bhagwati, 1977).

It has also been argued that this theory formed the basis for the establishment of international arrangement for managing world trade such as the General Agreement on Tariff and Trade, the World Trade Organization, and other bilateral trade agreements like NAFTA, EU - ACP Economic Partnership Agreement, etc (Spero and Hart, 2010).

Contemporary to this theory however, are the Marxist and neo-Marxist and structural theories like Dependency, World System, and underdevelopment. These theories, especially Marxism were rooted in historical dialectics of materialism which is anchored on the notion that every society either domestic or international is made up of two classes of the oppressed and the oppressor and that the position of each class is a function of its placement in the social relations of production. Theses theorists argue that third world countries are poor not because they are illiberal (as the neo-liberal theory claims), but because of their history as subordinate elements in the world capitalist system. They contend that the international market is under the control of capitalists, whose economic base is in the developed capitalist Europe, North America and Japan (Amin, 1976; Baran, 1968; Frank, 1969).

Free flow of trade so much desired by liberals only succeed in making the capitalist classes of both the developed and under developed countries to extract the economic wealth of the under developed countries

for their benefit. Trade relations between North and South is conducted on the basis of unequal exchange, in which control of the international market by the monopolies headquartered in the developed capitalist countries leads to declining prices for the raw materials produced by developing countries and rising prices for the industrial products produced by advanced countries (Amin, 1976).

These theories argue further that the current system of international trade encourages the South to concentrate on backward form of production (commodity) that prevent development. They contend that trade and investment in its current form removes capital from the South and necessitates a form of dependence in which countries in the South will be borrowing from the Northern financial institutions both public and private (Cardoso and Falleto, 1979; Arghiri, 1972).

The works of the structuralisms is grounded in a theoretical framework of analysis which states that capitalism is a mode of production that has become trans-societal and which in modern times spans practically all the nations of the world (Hoogvelt, 2001). They also see the states as constitutive units that have structural relationship predetermined by the world capitalist economy. As Wallerstien and Amin (1979) contend, it is the 'deep logic of the capitalist mode of production itself that yields the nodal positions within the global structure that nations occupy. This found expression in Wallertein's analysis of core-periphery and semi-periphery relationships (Amin, 1980; Wallerstein, 1979).

According to Colin Rey, 'to an embarrassing degree, not only did modernization theory failed to see that African backwardness was shaped by colonization, but it also failed to see how far the post independent

pattern of trade and investment, the pattern of aid given to local elites or the transfer of western tastes reinforced the backward in egalitarian structures of the ex-colonial economies' (Rey, 1996). From the Marxist perspective, the solution to the inequality between the North and the South is for the South to delink from the system. However, the structuralisms like Wallerstein believe that the system can be restructured for even development. The structuralism approach also recommended the combination of import substitution with regional integration with the goal of diversifying production away from agriculture and raw materials and toward manufacturing and services.

However, an evaluation of the Marxian and neo-Marxian strands of the theory has revealed some short falls, most especially in the light of the changing configurations of power between the Global North and the Global South. As Hoogvelt (2011) argued, historical materialism has failed in three respects; 'first, in the lack of awareness of its own historical roundedness; second, in the pre-Gramscian conception of a unidirectional connection between economic structure on the one hand, and institutions and ideas on the other; and third, in the altogether too abstract and deterministic presentation of an unfolding history in which the progressive transformation of modes of production through the dialectic is a forgone teleological conclusion. The failure of Soviet type communist social-economic arrangement and the gradual integration of the Eastern European countries into the global capitalist system, especially after the end of the cold war between the East and the West, bear this argument out.

Also, the South as an economic category is no more as it was when the Marxists and the structuralisms propounded their theories. Some of the

countries of the South like China, India, Brazil and South Africa are increasingly assuming more position of prominence in the international political economic relations as their economies have grown significantly over the past thirty years. As the stalemated Doha Development Round has clearly shown, trade relations between the North and the South can no longer be subjected to the whims and caprices of just one country or a group of countries. The changing balance of economic power is equally reinforced by the declining influence of the United States of America, which has served as a form of hegemony since the end of the Second World War. This decline is now being counterbalanced by the CIBS countries, especially, China. Over the past three decades, there are several changes in the theoretical framework of analysis of the relations between the North and the South. Few of these theories attempt to synchronize the differences in the neo-liberal and radical theories. One of these is the Critical Social Theory advanced by Robert Cox. This author, as Hoogvelt submits, managed to synthesize and transcend the neo-realist and neo-Marxist approaches, reintegrate the separate sub-fields of international economic relations and strategic studies, and overcome the structure/agency dichotomy (Hoogvelt, 2001).

Cox (1981, 1992) challenged existing theories of international relations on the grounds that they are too obsessed with relations between states; for failing to develop conceptual apparatuses that may account for the many Tran societal linkages that are growing up; and for not being critically aware of their own roots. His theory examines the world order and historical change-that is the transformative change in the organization of world affairs (Cox, 1981, 1992, Hoogvelt, 2001).

Hence this differs from the posture of both Marxist and neo-liberal theories that are essentially deterministic (Cox, 1981, Hoogvelt, 2001). The relevance of this theoretical background to the analysis of the EU-ACP Economic Partnership Agreements and its implications for non-oil sector development in Nigeria is to be able to situate the current European Union's drive for the full liberalization of economies of the African, Caribbean, and Pacific region within the context of neo-liberalism. As William Brown contends, the current EU-ACP development cooperation, much like the historical pattern of relationship has been restructured to reflect liberal and multilateral norms of international relations (Brown, 2000). In other words, both the multilateral framework of negotiation under the World Trade Organization (which is now stalled due to entrenched interests and uncompromising position of the North on the issue of market access to agricultural products); and the preferential trade agreement, such as the EU-ACP Economic Partnership Agreement are cast in the mold of neo-liberalism and its penchant for the promotion of free trade.

## 2.2 History of EU-ACP Economic Agreements

The General Agreement on Tariffs and Trade was one of the Breton Wood institutions put in place after the Second World War to an age trade relations between the North and the South. However, the third world countries felt the arrangement was not in their interests because the Kennedy Round of Negotiations of 1964-1967, which was the first Round, in which they participated actively, did not favor them. For instance, restrictions against manufactures from third world countries such as textile products and clothing remained higher than the acceptable standard;

agricultural protectionism, including that on tropical products remained intact; and quantitative restrictions and non-tariff barriers remain prevalent (UNCTAD, 1968).

In reaction to this, the third world countries protested and in 1968, agreements (GATT) were reached on the principle of establishing a preferential scheme, which was based on no reciprocity. It was within the context of this agreement, which was enshrined in Article XX1V of the General Agreement on Tariff and Trade that the EU-ACP relationship found expression. This article allows the third world countries to export their commodities to the European Union market-duty free. A more comprehensive framework of this relationship took effect in 1975, with the launching of the Lomé Convention. Although a casual look at the various provisions of the Lomé Convention may suggest that the EU is actually interested in the development of the ACP region. Spero and Hart (2010) argued that the non-reciprocal basis of the relationship and the creation of System for the Stabilization of Export Earnings (STABEX), among other incentives were a direct response to the relative economic importance of the third world countries at that time.

Article 24 of the GATT allows for free trade areas (or Customs Unions) between trading partners, with reciprocal tariff concessions beyond Most Favored Nation (MFN) level provided that 'substantially all' trade is liberalized within a 'reasonable' length of time. This forms the basis of the EU regional integration efforts. Also, the Generalized System of Preferences established under the GATT Enabling Clause of the 1970s, allows for a more favorable and non-reciprocal treatment of developing country exports. However, this came to an end in 2000 after the signing of

the Cotonou Partnership Agreement between the EU and the ACP countries. According to the duo of Stocum-Bradley and Nikki Bradley, the objectives of the ACP-EU Partnership as stipulated in the Cotonou Partnership Agreement (Part 1, Title 1, Chapter 1, Article 1) are: To promote and expedite the economic, cultural and social development of the ACP states, with a view to contributing to peace and security, and to promoting a stable and democratic political environment. The Partnership shall be centered on the objective of eradicating poverty consistent with the objectives of sustainable development and the gradual integration of the ACP countries into the world economy.

The Cotonou Partnership Agreement paved the way for the substitution of the nonreciprocal trade preferences for reciprocal free trade arrangements in combination with a broad agenda of regulatory policies and supporting measures-that is the Economic Partnership Agreements (Farber and Orbie, 2009). In 2005, the EU-ACP Cotonou Partnership Agreement also ‘recognized the failures of the Lomé Convention to reduce poverty in the ACP countries and therefore set new goals for poverty reduction and increased aids, within the context of the Millennium Development Goals (Spero and Hart, 2010). However, these goals still remained largely unmet. The proposed Economic Partnership Agreement, which covers both trade and non-trade issues was expected to have taken effect by January 2008. However, at the end of the negotiation in December 2007, only one out of the six ACP regions involved has signed a full EPA, namely, the Caribbean countries of the CARIFORUM; including the Dominican Republic, Guyana, Haiti and Surinam. Interim EPAs have been negotiated with a number of other ACP countries (e.g. Cameroun, Ghana, Cote d’Ivoire,

Zimbabwe, Botswana, Fiji, and Papua New Guinea) and sub-regions (e.g. the East African Community, ESA). Other countries have reverted to preferential market under the Generalized System of Preferences (GSP) (e.g. Congo Brazzaville, Nigeria, Gabon) and its Everything But Arms (EBA), variant for the Least Developed Countries (LDCs), (e.g. Sudan, Angola, DR Congo, Liberia, Senegal) (Farber and Orbie, 2009).

Even though Article 36 (1) of the EU-ACP Cotonou Agreement expressed the compatibility of the EPA with the WTO trading agreements, contentious issues under the stalemated Doha Development Rounds such as Investment, Competition, Government Procurement and Trade Facilitation (the Singapore Issues) have been incorporated into the EPA negotiation.

This was forcefully stated by the European Union thus: Excluding all commitments on trade-related rules (e.g. Services, Investment, and Government Procurement, trade facilitation, intellectual property rights and competition) would be very difficult to reconcile with Cotonou. Moreover, rules are the essence of the development dimension of EPAs. On these areas, it is clear that the EC does not look for access for its companies. Its objective is to promote regional harmonization as well as regional preferences so that operators would be faced with predictable transparent and enforceable rules (EU, 2006).

The current posture of the EU with regard to its trade relationship with the South has some historical, political and ideological connotations. According to Hurt (2003), the signing of the Cotonou Agreement means politics is now at the center (of the relationship) with its emphasis on political dialogue and effective management of aid. Also the Lomé

Convention and the succeeding agreements had in it neoliberal idea which posits that free trade necessarily brings about economic development.

The contents of the EU-ACP EPA also reflect some of the main components of the post-Washington Consensus in international development such as regulation and aid for trade (Stiglitz, 2005, Farber and Orbie, 2009).

The EU is also attempting to export its own model of integration at a regional level to developing world. Confronted with the so-called failure of the Lomé regime, which provided non-reciprocal market access, European policy-makers believe that the ACP countries would benefit from regulatory integration along the lines of the EU model.

## 2.3 Paternalism or Partnership? EU-ACP Economic Partnership Agreements: A critical Analysis

As stated in the preceding part of this study, the relationship between the North and South has been characterized by unequal exchange. On a general note, the combination of fundamentally weak economies, negative societal legacies of colonial rule, political instability and an often tenuous grip on power by many regimes in the South has meant that these states had a pressing need for increasing access to international resources in order to maintain their rule. Also, after the politics of the cold war in which the countries of the South received some assistance as compensation for their loyalty to the contending powers in the East- West block is over, the needs of the South still remains, which include the need to extend their access to material support from the North in the form of aid and from the international economy in the form of changes to the rules and forms of regulation governing the world economy (Brown, 2000).

From all indications, European Union has been concerned with using its influence on the ACP countries to its economic advantage. In this connection, the EU act like a mercantilist actor in international trade. It is a trade power, which attempts to break open foreign markets (in competitive industrial goods and services), although its main market, especially agriculture, is relatively closed. This mercantilist aspect of the EU's relations with the ACP countries is especially expressed in the fact that it has been the government that has been negotiating the various agreements on behalf of the business and companies in their home countries. This explains why it is difficult if not impossible to implement most of the commitments made during negotiations to help the industrial competitiveness of the companies in the ACP countries (Brown, 2000).

Dani Nabudere took this argument further when he notes that 'the industrial cooperation provisions (in the Lomé Convention) are closely linked to the financial and technical provisions. This is so because, the amount of "aid" and "technical assistance" that can be extended by the EU are made possible through exploitation of labor in the EEC and in the ACP States, and through the monopoly control of technology. It is therefore unrealistic in real practices to expect monopolies to grant meaningful aid and technical assistance to the ACP States, when the same states who would use that aid and assistance, interfere with the exploitation of that labor in their states. Moreover, the use of such technical assistance would enable these States under given conditions to develop their own industry and in the process their own technology, thus depriving the monopolies of their sole property, which enables them to exercise the present world economic control (Nabudere, 1975).

This calls into question the whole issue of technical assistance, grants and aids which the EU has been using in the various processes of negotiation as a tool to persuade the ACP countries to open their economies to manufactured products from their member countries. Given this circumstance, that is, the interest of the monopoly capitalist organizations to maintain the same pattern of relationship based on unequal exchange, the issue of partnership between EU, which represents these interests and the ACP needs further investigation and scrutiny. In the context of this analysis, Sally Mathews' observation in respect of Africa's relations with the West is apposite. She submits that "there has been considerable variation in the relations between Africa and the West over the last few centuries. Different eras have seen different relations, and different countries and institutions of the West have varied in the nature of their relations with Africa, with relations between the two regions more often than not, being characterized by exploitation of Africa by the West. While it may be unfair to assume, on the basis of past experiences, that the West is necessarily a bad partner for Africa's development, it certainly cannot be assumed that all western countries and institutions are helpful well-intentioned partners eager to further Africa's development" (Mathews, 2004). As appendix one shows, the trade balance between EU and ACP countries from 1999-2008 has been in negative. While it was -475 in 1999, it stood at -8, 838 in 2008. This shows that overall, ACP countries have been importing more from the EU than they export to the EU and exports to EU has been essentially based on raw materials, which deprive the ACP countries of benefits associated with manufacturing such as job creation, national brands and more stable source of revenue generation.

In evaluating the trade relationship between the EU and ACP countries, four inter related periods of their engagements are examined. Following Samir Amin (1990) Andre Gunder Frank (1978) four distinct phases of economic history between two economic blocks can be distinguished. They are: the first period being the pre-capitalist period from (pre-history to1500); the second period being the mercantilist period (from 1500 to 1800); characterized by the slave trade; the third being (from 1800 to 1950s) defined by European colonization and attempt to establish European dependent economies; and the present post-colonial economies (beginning around 1960), (Rugumamu, 2005).

In the pre-history period, Africans related on an equal term with the Europeans as they engaged in buying and selling of ivory, palm oil and other products among one another. While slavery accelerated any inherent crisis of disintegration in African economies and destroyed traditional technologies by the forced exports of their practitioners, it vastly retarded primitive capital accumulation by destroying existing forms of capital and inhibiting additional accumulation over centuries of human exploitation. This drastic annihilation of productive forces operated everywhere in Africa to stultify technological development and intensify the contradictions of the initial underdevelopment of the people and the region (Onimode, 1988).

In contrast to the debilitating effect of slave trade to the under-development of the countries of the South that experienced it, slave looting provided an important part of the primitive capital accumulation of North America and Europe for launching their agricultural and industrial revolutions from the 18th century as it supplies these continents with the material precondition of accumulation and concentration of money capital

for the transition from feudal and petty commodity producing social formations to industrial capitalism (Onimode, 1988).

Wallerstien reinforces this view. By his own account, the slave trade served as the cutting edge of the peripheralization of Africa in the period 1750-1900, but it was also incompatible with it because the production of slaves is less profitable than cash-crop production, forcing slaves to be continuously drawn from outside the world economy. He also contends that Great Britain sacrificed logical consistency to the complex and contradictory economic needs of powerful internal forces to prolong slave trade, even when it was not right to continue to do so (Wallerstien, 1974). The major historical factor of this period was the integration of the region and entry of the African continent into the modern world system (Wallerstien, 1988).

The steady growth of merchant capital, in the specific form of Atlantic slave trade, significantly modified the social formations of the region. According to Abdoulaye Bathiley (1994), the epoch of the slave trade opened by the assault of merchant capital on the social formations of the region and the role of the latter in the transformation of the state in Africa had a number of fundamental features. These include the fact that the Atlantic slave trade was conducted by merchant capitalists benefiting from the military support of the European powers; the Atlantic system shifted the trade items from natural produce to the producers themselves as slaves became the main commodity; the development of the Atlantic slave trade and the expansion of the colonial conquest set the scene for the loss of autonomy for African social formations, which led to their ultimate subjugation. This loss of autonomy became even more manifested during

the colonial rule as the foreign powers took effective control of both social, economic and political institutions and deployed these to the best advantage of their home countries.

Walter Rodney in his classic book, How Europe Underdeveloped Africa also lend credence to these views and argued that beyond the internal disarticulations that slave trade caused in Africa, it has some external dimensions. For instance, he contends that it was 'European capitalism, which set slavery and the Atlantic slave trade in motion'. This was done to provide laborers for sugar plantations in Brazil, Portugal and Spain, among other places (Rodney, 1981). In other words, slave trade effectively laid the basis for the current position of underdevelopment and unequal exchange between EU and Africa. During the period of this trade, able bodied men who should have developed the continent were forcefully evacuated, with millions dying along the way. The local economies also suffered because there was massive reduction in population. Even though no actual figure can be stated for the numbers of Africans exported into Europe, they are not less than ten million people within the four centuries of slave trade from 1445 to 1870. Easy gains from sales of fellow human beings also diverted attention from agriculture, craft and local technologies which would have led to capitalist development in the continent (Rodney, 1981).

## 2.4 Colonial and Post Colonial Periods and Pattern of Relations between the EU and ACP Countries

As a product of capitalist development, colonialism ensured the colonies were fashioned in such a way that they would permanently service the accumulation needs of the fully capitalist economies' of the North-in our own case, that of the European Union (Biel, 2000). This was evidently

manifested in the nature of the political economy that was established which ensured that attention was shifted to the production of export based cash crop. Provision of infrastructure such as railway networks was also provided only to link the ports to the hinterland where the products can be brought to the ports for exports (Ake, 1981). Samir Amin has argued that 'the fundamental non-linearity of historical experiences between the industrialized and the underdeveloped countries is rooted in the colonial role of imperialism and its contemporary equivalent, neo-colonialism. It was an integral part of the logic of the colonial system to keep the colonies under primary production, technologically backward and underdeveloped' (Amin, 1988).

The combination of narrow specialization in primary production, concentrated trading partners, all reflect the non-viable integration of the third world countries into the world economy. This is with respect to such basic indices as the share of external trade in the economy of the ACP countries, the commodity composition of exports, low-intra-regional trade, and unequal exchange and trade fluctuations.

The Cotonou Agreement and the Economic Partnership Agreement appears to be a continuation of the neo-liberalization of the EU-ACP relationship as it builds essentially on trends that have developed over the history of the various Lomé Conventions. This agrees with Stephen Hurts view that the language of the Cotonou Agreement cleverly blends ideas of consent and coercion (central to the Gramscian perspective). Here consent is achieved through notions of 'dialogue', 'partnership' and of ACP states 'owning' their development strategies. While coercion is present in the EU's presentation of Economic Partnership Agreement (EPAs) as the only

viable alternative and also through the implementation of the frequent reviews of aid provisions that have conditionality's, attached (Hurt 2003).

To underscore the coercive power of the EU, and in line with the neo-liberal bend of its foreign policy, the Cotonou Agreement and the EPA that follow it included a clause covering human rights, good governance, rule of law, which the ACP states opposed during the negotiations of the previous Lomé Conventions. Although it is desirable for ACP countries to incorporate these issues in the management of their domestic affairs, the fact of their sovereignty should have precluded the EU from making these issues as part of their conditionality's for granting aids to offset the costs of adjustments that may emanate from the agreements.

Severine Rugumamu, (2005) essentially underscores the continuation of the relationship of unequal exchange between the EU and ACP countries, thus. 'despite the preferential access to the EU market that was offered under various Lomé Conventions, ACP exports to Europe have deteriorated during the past two-and-a half decades of trade and aid cooperation the ACP 's share of total EU imports fell from 6.7 per cent in 1976 to 3 percent in 1998. This reflected the declining share of the ACP in world trade, which was cut in half from 3 to 1.5 per cent during the same period.

The fall in real commodity prices, the diversification of EU's sources of raw materials and the development of substitute products are responsible for this decline and they have far-reaching implications for the ACP economies. The one-sided nature of power and prerogatives to say one thing and do exactly the opposite or apply the rules to one's advantage in a relationship, supposedly based on partnership, has been further interrogated by Nikky Bradley and Andrew Bradley. They contend that power

asymmetries infiltrate all aspect of the EU-ACP Partnership, including provisions designed to govern the relationship (Bradley and Bradley, 2010). For instance, the EU talks about provision for 'consultation procedures' as enshrined in Article 9, which specifies that respect for human rights, democratic principles and the rule of law constitute 'essential elements of the partnership and that good governance is its fundamental element. Article 96, Paragraph 27 of the Agreement 'foresees that in cases of violation of one of the essential elements, one party can invite the other party to hold consultations under Article 96 aim at examining the situations with a view to finding a solution acceptable to both parties. If no solution is found, or in emergency cases, or one party refuses the consultations, appropriate measures can be taken (European Parliament, 2006).

This threatening provision is at variance with the principle of mutual respect in any formal negotiation. Also, even though the provision is phrased to allow either party to invoke it, the EU has ever done so. This reflects the division of power within the relationship. Besides, all 14 cases to date in which consultations were undertaken in accordance with Article 96 were subsequent to alleged violations by ACP States. The fact is that the EU has violated many rules such as violation of human rights of ACP immigrants in EU member states, the shipping of toxic waste on EU registered ships, the abuse of the rights of workers on the ships working on the high seas, fraud and corruption in EU member states and the failure to disburse promised aids to offset the cost of adjustments in ACP countries (Bradley and Bradley, 2010).

However, the ACP countries lack the capacity to as it were, to impose the so called appropriate measures as defined in Article 96 on the

EU. Also, the balance of power trickles down to any other manifestations, including the extent to which joint fact finding missions are deployed to political hot spots by the ACP –EU Joint Parliamentary Assembly. In this relation of unequal partnership, the EU is at liberty to use development aid, trade preferences and other carrots to push its agenda and interests and sometimes, the threat of these as sticks to compel the ACP countries to follow their prescriptions on matters of economic and political importance. Also in justifying a new arrangement under the EPA with the ACP countries, the EU argued that not only did it affirm the value of EU-ACP relations in a multipolar world but that the relationship would help to enable the kind of world development that is more compatible with European political and social values (CEC-DG VIII. 1997a: vi cf Brown, 2000).

This is a form of the repeat of the old idea of conceiving imperialism and colonialism as a 'civilizing mission'. Another basis for the inequality in the relationship between the EU and the ACP countries is the sheer differences in the level of development of the two economic regions, see table (2.1) below. According to Oxfam International, the EPA negotiations are being conducted between the 25 EU countries which have a combined GDP of $13, 300bn and six groups of African, Caribbean and Pacific countries. Among these ACP countries are 39 of the world's Least Developed Countries (LDCs). The smallest group, the Pacific Islands has a combined GDP of only $9bn, which is 1400 times smaller than the EU's. The largest of this group, which West Africa, is more than 80 times smaller than the EU in terms of GDP. Total GDP for the ACP in 2005 is a mere $425bn which is just 3.2% of the EU's GDP. The ratio of the ACP GDP to that of the European Union is a mere 3.1. In these scenarios, the obvious

inequalities effectively place the EU at a point of advantage over the ACP countries on matters being negotiated. This is especially so because these figures reveal the relative economic strength of the parties to the negotiation, which also determines their bargaining powers (Oxfam, 2006).

Other than the above, other scholars have argued that the problem with the Economic Partnership Agreement 'is both with the substance of the issues being negotiated and the manner in which it is being done.' Whereas the EU negotiates as one entity, this is not the case with African countries, many of which are so small and overtly dependent on external aids for sustenance. These countries are more or less hostage to pressure from Europe in the form of threats, sanctions as well as 'aids' sweeteners-to agree to something that may not be in their long term interest (Tandon, 2010).

Table (2.1): Oxfam. Unequal partners in trade

| EPA | Ratio to EU GDP | Percent of EU UDPI | GDP 2005 (billion US$) |
|---|---|---|---|
| EU | - | - | 13.300 |
| SADC | 300 | 0.50 | 66.000 |
| ESA II | 178 | 0.56 | 75.000 |
| West Africa | 82 | 1.22 | 162.000 |
| Central Africa | 330 | 0.30 | 40.000 |
| Caribbean | 185 | 0.54 | 72.000 |
| Pacific II | 1.414 | 0.07 | 9.000 |
| Total | 31. | 3.20 | 425.000 |

Source: World Bank (2005)

One other effect of this EPA negotiation on Africa is that ruptured African sub-regional integration efforts. Once, implemented, the EPA has a tendency to further de-industrialize African countries and worsen the crisis of unemployment through food exportation to African countries (South Centre, 2010).

There are clauses in the EPA which can best be described as toxic because of their potential dangers to the economies of the ACP countries. One, the Standstill Clause under the EPA (Art 13) disallows the possibility of increment in tariff for 25 years after signing the agreement. This is a historical because European countries have employed tariffs at different periods to protect their local industries. This clause also has a tendency to stifle the growth of infant industries in the ACP countries (Chang, 2002).

Article 15 of the EPA also disallows new export taxes. However, as Yash Tandon (2010) argues, this is a self-serving provision which will only ensure the free flow of raw materials from the ACP countries to the EU. But the sake of the future industrialization of Africa, and for the protection of the strategic resources, export taxes are necessary. Article 15 of the EPA which demands that ACP countries extend any favor granted to countries in the South like China, India, and Brazil etc. to the EU can only succeed in undermining the desire of the ACP countries to forge development alliances with the countries of the South. The introduction of the 'Singapore Issues' which is covered by the Rendezvous Clause (Article 37 of the EPA) is contrary to the position of other developing countries on these issues under the Doha Development Round. Bringing these issues through the backdoor by the EU will not be in the interest of ACP countries (Tandon, 2010).

## 2.5 Sudan and EPA Negotiations

Since signature of Cotonou agreement in 2000, Sudan has participated in negotiations related to the EPA at first stage of ACP

negotiations in Brussels. Sudan formed the National Committee on trade policy and development headed by undersecretary. This committee includes concerned bodies i.e. Ministry of Foreign Trade, Ministry of Finance and National Economy, Ministry of Agriculture and Forestry and other committees. NGOs and civil organizations, businessmen of chambers of commerce, chambers of industries, union trade of Sudanese workers. Preparation and specialized meetings to raise awareness about EPA among stake holders. Sudan hosted some meetings concerning EPA i.e. trade related issues, regional negotiating forum (RNF), in addition to ACP-EU summit in Dec. 2006 in which Khartoum Declaration was issued. The summit adopted specific guidelines to assist in negotiation with EU. Sudan is participating actively in negotiations and chaired the regional negotiating committee for 3 times and also headed the development group in ministerial level. The experience of negotiations of others African groups with EU are presented in the next section (Ministry of Agriculture and Forestry, 2008).

## 2.6 Eastern and Southern Africa (ESA)

The European Commission initiated an interim trade agreement with the Seychelles and Zimbabwe of the ESA region in Brussels on 28 November 2007 with Mauritius on 4 December 2007 and with Comoros and Madagascar on 11 December 2007. The deal includes a WTO-compatible market access schedule, provisions on development cooperation, fisheries and other issues. Negotiators confirmed that the agreement is opened to other parties in the region, who are expected to join in the near future (Ministry of Foreign Trade, 2008).

The region held specialized meetings regarding the six subjects, this meeting vary from subject to another i.e. the region held many meetings of market access, agriculture, development and fishery, and few meetings in trade related issues and trade in services. The ESA and EU agreed that the ESA prepared the proposal of economic partnership and discuss it with EU. The ESA prepared the proposal of economic partnership, but there are some incomplete subjects like:

### 2.6.1 Market access

The ESA ask free quota and free duties to all its export products. The ESA object to the following:

Free duties to capital goods and raw material from EU to ESA.
Liberalize medium goods during 15 years.
Liberalize consumption goods during 25 years.
The above liberalization does not cover sensitive products list.

Now the negotiations on the following subjects:
SPS protocol.
Rules of origin protocol.
Trade related issues protocol
Sensitive products.

Definition of capital, raw material, medium and consumption goods.

Sugar, meat and banana protocols.

Safeguard protocol

Dumping protocol.

### 2.6.2 Development cooperation

It is one of the main important items in this negotiation especially most of the ESA countries are LDCs that need financial resources to

build infrastructure of production and create a good environment for production.ESA provided the needs matrix including development priorities, EU mentioned that trade is a development's tool and development finance is available within Cotonou Agreement.

The view of ESA is to realize growth and address supply chain bottlenecks as well as foreign trade promotion. Cotonou Agreement will be expired in 2020, and EBA will remain (Ministry of Foreign Trade, 2008).

### 2.6.3 Agriculture

Insure the importance of agricultural sector to state members and the need to assist agriculture and secure food security, EU rejected negotiation about Common Agricultural Policy (CAP), and commodities protocols issues as it is contradicted with free trade agreement.

### 2.6.4 Fishery

This sector is essential to some countries within ESA. There is a general framework regarding sustainable resource of fishery, added value and creation of partnership to improve competitiveness capacities and provision of additional resources but there is a debate with EU in such framework.

### 2.6.5 Trade related issues

The ESA and EU agreed to facilitate trade, competition, investment, trade related intellectual property rights and transparency in governmental procurement, as these issues are development related ones, EU commit to provide technical assistance and capacity building.

In the field of custom and trade facilitation, the ESA and EU negotiated the facilitation, harmonization of custom laws and procedures

related to import, export transit, transparency improvement and using international standards (Ministry of Foreign Trade, 2008).

### 2.6.6 Goods covered

The agreement allows for 100% liberalization by value by the EU as of 1 January 2008, with transition periods for rice and sugar. The Seychelles will liberalize 975.5% of its imports from the EU by 2022: 62% of their imports will be liberalized after five years, 77% by 2017 and the remaining 20.5% by 2022. Zimbabwe will liberalize 80% of its imports from the EU by 2022: 45% by 2012 with the remaining 35% of their imports being liberalized progressively until 2022. Mauritius, on its part, will liberalize 95.6% of its imports from the EU: 45.5% in 2008, 53.6% by 2017, and the remaining 42% will be liberalized in 2022. Coverage for Comoros and Madagascar is over 80% of its imports from the EU. In the case of Comoros, 21.5% of their imports will be liberalized after five years, and the remaining 59.1% will be progressively liberalized by 2022. In the case of Madagascar, 37% of its imports from the EU will be liberalized after five years; the remaining 3.7% will be progressively liberalized 2022.

### 2.6.7 Goods excluded

Several products from different sectors have been excluded from liberalization, mainly due to the need to protect sensitive products or infant industries in the countries. In the case of Seychelles, these include meat, fisheries, beverages, tobacco, leather articles, glass and ceramics and vehicles. In the case of Zimbabwe, excluded products include products of animal origin, cereals, beverages paper, plastics and rubber, textiles and clothing, footwear, glass and ceramics, consumer electronics

and vehicles. Mauritius excluded from liberalization live animals and meat, edible products of animal origin, fats edible preparations and beverages, chemicals, plastics and rubber articles of leather and fur skins, iron and steel and consumer electronic. In the case of Comoros, the excluded goods are mainly of animal origin, fish beverages, chemicals and vehicles. For Madagascar, the excluded products comprise meat fish, products of animal origin, vegetables, cereals, beverages, plastics and rubber, articles of leather and fur-skins, paper and metals among others.

### 2.6.8 Other features

The parties will cooperate to facilitate the implementation of the agreement and support regional integration and development strategies. They agreed that cooperation will be based on the ESA Development Cooperation Strategy and a jointly agreed Development Matrix. They will cooperate to mobilize resources additional to the financial framework of the EU, from EU Member States and other donors, in particular expanding Aid for Trade commitments, relating specifically to EPA support requirements and adjustment costs.

The agreement contains an extensive fisheries chapter, mainly aiming at reinforcing cooperation on sustainable use of resources (Ministry of Foreign Trade, 2008).

# CHAPTER THREE

# METHODOLOGY AND FRAMEWORK OF ANALYSIS

## 3.1 Economic and Trade Environment of Sudan

Sudan is the largest country in Africa in terms of size-over 2.5 million square kilometers – and has diversified geography, ecology and demography. With a population of 37 million in 2006, Sudan is one of the most sparsely populated countries in the world. However, despite trade liberalization and notable economic progress in recent years, Sudan's abundant natural resources remained under utilized and its trade potential is largely unexploited. Since the start of commercial exploitation of oil in August 1999, the economy of Sudan moved from high dependence on agriculture to heavy dependence on oil with little genuine economic transformation, but agriculture remains the main source of employment and income for the majority of the population. Political factors - particularly civil wars - and policy mistakes often combine to slow the country's progress towards accelerated and sustained growth and improved living standards (World Bank, 2007).

Following a decade of mounting macroeconomic imbalances and instability, a new program of structural adjustment was adopted in 1992. Adjustment policies aimed for liberalization of prices and markets, reduction of internal and external imbalances, and improving economic performance through reallocation of resources and greater private sector participation. The policies initiated a process of economic recovery that

resulted in the unification and relative stability of the exchange rate, declining inflation rate and an increasing real GDP growth rate. Budget deficit was reduced from 3.8% of GDP in 1996 to 0.7% in 1998, due to cuts in government spending (Ben Hammouda, 2006).

After the exploitation of oil, Sudan's economic have further improved, with the average real GDP growth of 7.3% between 2001 and 2006 with the largest contribution to GDP growth originating from the industry and mining sector followed by the agriculture, services and construction sectors (MOF, 2005; EIU, 2007). Regarding the structure of production, agriculture contributed 38.6% of GDP in 2005, industry and mining 43.5%, construction 4.1% and services 33.6% (MOF, 2006; EIU, 2007).

## 3.2 Analytical Framework

To achieve the study objectives the study analytical framework is using (percentages) to quantify and explore the agricultural trade between Sudan and other EPA with EU countries. The Armington model non-linear specification was used to analyze the potential of Sudan agricultural trade as member with the EU, within EPA countries.

## 3.3 Overview of the Armington Model

Armington (1969) introduced into international trade theory the assumption that final goods internationally traded are differentiated on the basis of the country of origin. He assumed that, in anyone county, each industry produces only one product, and that this product is distinct from the product of the same industry in any other country. For simplicity, the assumed there is only one consumer in each country. In the eyes of this consumer, the products of one industry which originate

from different countries are a group of close substitutes. This set of assumption is called the Armington assumption. It relates to the demand side of the model (lioyd and zhang, 2006).

## 3.4 Armington Non-linear Specification

This study adopted the Armington model non-linear specification to achieve the study objectives. The model is a comparative static approach. In a static framework, one can analyze how changes in government (domestic and trade) policies or in world markets affect the supply and demand relations in each region, and how changes in supply and demand modify the trade balance (Abdel Karim, 2002). The general nature of the model is iterative, i.e. it allows for the simultaneous determination of supply, demand, trade levels and prices including their cross-market linkages for all commodities covered. Fundamentally, the model is a price equilibrium model. Sadoulet and de Janvry (1995) stated that the model approach extends the analysis of prices and non-price policy instruments from the analysis of their impact in commodity or factor specific partial equilibrium models to the interactions among markets on both the product and factor side.

The model consists of a set of demand and supply equations for each commodity with the level of production and demand determined by factors including prices, income, demand and supply shift variables and various other assumptions about policies.

## 3.5 Non-linear Specification of Armington

One of the assumptions of the original multiple market model is product homogeneity, which is not consistent with problem at hand,

where product differentiation exist (heterogeneity). To solve this problem a modified version of multi-market model is developed by incorporating Armington assumptions (CES)[(1)] constant elasticity of substitutions and (CET) constant elasticity of transformation functions. In the modified model the agricultural trade between Sudan, other EPA countries and the rest of the world are modeled.

Francois and Hall (1997) followed Armington (1969) in assuming well behaved references over a weakly separable product category that comprises similar, but not identical products. These imperfect substitutes are differentiated by their country of origin.

Armington model can be specified as a system of non- linear equations. First the Armington composite good ($q_d$) can be defined as a constant elasticity of substitution (CES) composite of domestic good and of imports from other countries.

$$q_d = \left[ \sum_{i=1}^{n} \alpha_i X_i^{\rho} \right]^{1/\rho} \qquad (3\text{-}1)$$

Where $X_{i,}$ is domestic good if i =1 and is for imports if i = 2….n,

$\rho$ is CES activity function exponent

$\rho = 1 - \left( \frac{1}{\sigma} \right)$ , $\sigma$ is the elasticity of substitution (CES) (3-2)

$\alpha_i$ is the CES weight of good i .

$$\alpha_i = \left[ \frac{X_i}{k} \right]^{(1/\sigma)} \qquad (3\text{-}3)$$

Where, k is the calibrated constant.

(1) The procedure followed by Francois, J. and Hall (1997) is applied

The model is calibrated by scaling the quantities so that internal prices are all unity in the benchmark. This includes the price for Armington composite good (P). The price index for the composite good can be shown to equal:

$$P = \left[ \sum_{i=1}^{n} \alpha_i^{\sigma} P_i^{1-\sigma} \right]^{1-1/\rho} \qquad (3\text{-}4)$$

Where $P_i$ is the calibrated domestic product market price if i =1 and is the calibrated internal price for imports if i = 2….n.

At the same time, from the first order conditions, the demand for good $X_i$ is equal to:

$$X_i = \left[ \frac{\alpha_i}{P_i} \right]^{\sigma} \left[ \sum_{i=1}^{n} \alpha_i P_i^{1-\sigma} \right]^{-1} Y \qquad (3\text{-}5)$$

$$= \left[ \frac{\alpha_i}{P_i} \right]^{\sigma} P^{\sigma-1} Y$$ , where Y is the total expenditure (Y= P $q_d$)

The supply function of the composite good ($q_s$) can be specified as:

$$q_s = k_s P^{1-\varepsilon_s} \qquad (3\text{-}6)$$

Where $\varepsilon_s$ is the elasticity of supply for composite good?

The supply of domestic good ($X_{si}$) is presented by the following equations:

$$X_{si} = K_{si} P_i^{\varepsilon_{is}} \qquad (3\text{-}7)$$

The equation is extended to include trade measures (tariff) to represent the import supply equation as follows:

$$X_{si} = k_{si} \left[ \frac{P_i}{(1+t_j)} \right]^{\varepsilon_{si}}$$

Where $X_{si,}$ is the domestic supply if i =1 and is for imports supply if i = 2….n,

$\varepsilon_{si}$ Is the elasticity of supply for domestic good if i =1 and is for imports if i = 2….n,

While t, is the tariff rate and $k_{si}$ is the calibrated constant.

## 3.6 Equilibrium Condition

The following equilibrium conditions and constraints are maintained in the model.

$q_s - q_d = 0$ For composite good (3-8)

$X_{si} - X_i = 0$ For domestic and imported goods (3-9)

At the same time, the composite price constraint should be satisfied as follows:

$$\left[\sum_{i=1}^{n} \alpha_i^{\sigma} P_i^{1-\sigma}\right]^{1-1/\rho} - P = 0 \qquad (3\text{-}10)$$

## 3.7 Output Transformation (CET) Function

Marketed domestic output can be allocated to domestic sales or to exports reflecting the assumption of imperfect transformability between these uses. The (CET) constant elasticity of transformation function, applied here is identical to CES function. The only difference in the mathematical statement is the sign in front of the functional exponent. In the case of the CES the exponent has a positive sign while in the CET it has a negative sign (Punt *et al*., 2003).

## 3.8 Domestic Demand Equation

$$q_i^{\,d} = d_i \cdot (P_i^c)^{\eta_i} \cdot \prod_{j \neq i} (P_j^c)^{\eta_{ij}} \cdot I_i^{\,\lambda_i} \qquad (3\text{-}20)$$

Where, $q_i^d$ is the domestic demand for commodity I,

$d_i$ Is the calibrated constant

$P_i^c$ Is the own domestic price represented by composite price (P)

$P_j^c$ Is the domestic substitute prices

$\eta_{ii}$ And $\eta_{ij}$ are the own and cross price elasticity respectively

$\lambda_i$ Is the income elasticity and $I_i$ is per capita income

## 3.9 Domestic Supply Equation

$$q_i^{\,s} = c_i \cdot (p_i^s)^{\pi_{ii}} \cdot \prod_{j \neq i} (p_j^s)^{\pi_{ij}} \qquad (3\text{-}21)$$

Where, $q_i^s$ is the domestic supply for commodity i,

$c_i$ Is the calibrated constant

$P_i^s$ Is the own domestic price represented by composite price (P)

$P_j^s$ Is the domestic competing prices

$\pi_{ii}$ And $\pi_{ij}$ are the own and cross price elasticity respectively (3-9)

## 3.10 Welfare Analysis

The concept of consumer and producer surplus has been employed to evaluate the sign and magnitude of welfare effect associated with policy changes (Loo and tower, 1990; Jechlitschka, 1997). Gain and losses to producers from price changes are measured as changes in producer surplus. Likewise, consumer gain or losses can be measured as changes in consumer surplus. Once we solve the system of equations defined above, we use composite prices for consumers and produces

based on a CES and CET price index to calculate consumer and producer surplus. Gain and losses to producers from price changes are measured as changes in producer surplus. Likewise, consumer gain or losses can be measured as changes in consumer surplus.

### 3.10.1 Producer surplus

The producer surplus (PS) is the area between the supply curve and equilibrium price line as shown in Figure (3.1). It is equal to the gross revenue ($R_i$) minus total variable cost ($TVC_i$) and it is represented by:

$PS = R_i - TVC_i$ (3-16), Where, $R_i = P.q_s$ and

$$TVC_i = Pq_s - \int_0^P q_s(p)dp = Pq_s - \frac{1}{\varepsilon_s + 1} k_s P^{\varepsilon_s + 1}$$

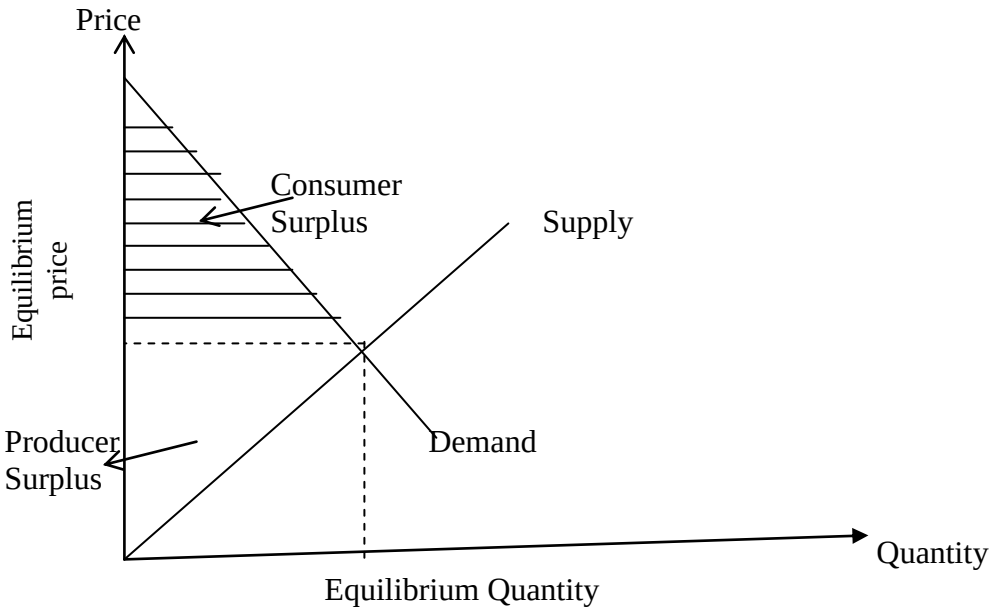


Figure (3.1): Producer and consumer surplus

### 3.10.2 Consumer surplus

The consumer surplus (CS) is the area between demand curve and equilibrium price line as shown in Figure (3.1). It can be measured by the difference between marginal utility, which indicates the maximum price

which consumers would be willing to pay for that unit, and the price actually paid (Sadoulet *et al*., 1995) and it is represented by:

$$CS = B_i - Y \qquad (3\text{-}17)$$

Where $Y = P.q_d$

$$B_i = P.q_d + \int_0^P q_d(p)dp = P.q_d + \frac{k}{\varepsilon_d + 1}(u^{\varepsilon_d + 1} - P^{\varepsilon_d + 1})$$

And

Where, $B_i$, Y and u are benefit, expenditure and maximum price respectively.

Finally, the net welfare (W) is derived by the sum of producer surplus, consumer surplus and tariff revenue (TR) in the case of CES function and it is represented by the following equation:

$$W = PS + CS + TR \qquad (3\text{-}18)$$

The tariff revenue is represented by the following equation:

$$TR = \sum_i^n X_{si}(P_i - P_w)$$

Where i= 2……n. and $P_w$ is the world price.

In the case of the CET function the net welfare is represented by the following equation:

$$W = B_i - TVC_i + F \qquad (3\text{-}19)$$

Where F is the foreign exchange earnings, and it is represented by the following equation;

$$F = \sum_i^n X_{si}(P_w(1 - t_i)$$

Where I= 2……n. and $t_i$ is the tariff rate.

## 3.11 Price Relationships

In most trade models used to quantify the effects of agricultural trade liberalization support policies are introduced exogenously in the

price linkage equation (FAO, 1995). This approach usually involves both, the use of a price wedge defining the absolute difference between domestic and international price levels and response parameter (transmission elasticity) indicating the connection between domestic and world market movements.

With the assumption that there are no trade restrictions on the commodities covered by the model, the domestic price of a commodity is assumed to vary in the same direction and to the same degree as the world market price (i.e. the response coefficient is equal to one). This representation of the price-linkage equations assumes a strong connection between movements in the world and domestic prices, taking into account taxation or subsidization (Braveman and Hammer, 1986, is represented by the following equations:

$$p_i^d = p_i^w (1 + r_i), \qquad i = 1, .., 8 \qquad (3\text{-}11)$$

$$p_i^\$ = p_i^d (1 + t^p_i), \qquad i = 1, .., 8 \qquad (3\text{-}12)$$

$$p_i^c = p_i^d (1 + t^c_i), \qquad i = 1, .., 8 \qquad (3\text{-}13)$$

By substituting equation 3.11 in equation 3.12 and 3.13 gives

$$p_i^\$ = p_i^w (1 + r_i), \qquad i = 1, .., 8 \qquad (3\text{-}14)$$

$$p_i^c = p_i^w (1 + r_i), \qquad i = 1, .., 8 \qquad (3\text{-}15)$$

Where, $p_i^d$ and $P_i^w$ are domestic and world market price, respective, $p_i^\$$ is the producer price for export and import-substitute crops, $p_i^c$ is the consumer price, $r_i$ is the protection rate on export and import-substitute commodities, when $r_i$ is less than zero this means this policy leads to taxation of producers, and an $r_i$ greater than zero means subsidization of producers, $t_i^p$, $t_i^c$ are the domestic rates of taxation of producers and consumers respectively.

## 3.12 Total Exports

To derive the total export value from the model, first the total export value for the exported crops in the model is measured by:

$$\sum \quad TE^m = \quad (^{q_i^\$} = q_i^d),\ p_i^w,\ i = 1, \ldots, 7 \qquad (3\text{-}16)$$

Where, $TE^m$ is the model export value.

Second step is to calculate the total agricultural exports, which is made up of the model exports and the rest of agricultural exports, as follows:

$$TE^a = TE^m + TE^{as} \qquad (3\text{-}17)$$

Where, $TE^a$ is the agricultural export and $GDP^{as}$ is the exogenous rest of agricultural exports.

Finally, the total export value of the whole economy is calculated. This value is considered to be composed of agricultural and non-agricultural exports, expressed as follows:

$$TE = TE^a + TE^r \qquad (3\text{-}18)$$

Where, TE is the total export value and $TE^r$ is the exogenous rest of the economy export value.

## 3.13 Government Revenues

Government revenues are derived from agriculture through border and domestic taxes. To calculate total government revenues, first government revenues generated inside the model are defined by:

$$\sum \quad GR^m = \quad (q_i^\$ . p_i^\$) + q_i^w),\ - I_i),\ i = 1, \ldots, 8 \qquad (3\text{-}35)$$

Where, $GR^m$ is the model government revenues.

Secondly, total government revenues are expressed by:

$$GR = GR^m + GR^r \qquad (3\text{-}36)$$

Where, GR is the total government revenues and $GR^r$ represent exogenous government revenues.

To sum up within the analysis of the response of agricultural trade of Sudan to policy changes, the base of the model has broadened to cover some additional macro-economic variables.

## 3.14 Armington Model for the Sudan Agriculture

The purpose of this part is to provide a detailed description of the methodological approach used for the analysis. Section one is devoted for data sources and management. Section two describes the conceptual framework of the model and it general nature. In section three a full description of the model is provided. Section four describes the structure of the empirical model, calibration and solving. A detailed simulated scenario, developed to achieve the study objectives in the final section.

There exist a number of reasons behind the selection of the modeling approach to analyze the impact of the EPA on Sudan's agricultural trade. The uses of the model can provide the following advantages over the other modeling approaches:

1. The model is more advance in terms of its capacity for policy analysis and formulation of alternative meaningful policy scenarios. The model is not highly demanding on the abstraction level and consequently, gives accurate expression of sector in question.
2. The model is scientifically standard and based on a well-accepted body of economic theory. Also, it can easily be adjusted to the problem at hand.

3. Beside the simplicity to handle, the recommended model can be easily built using standard software (e.g. Microsoft Excel) and has the added value of being less cumbersome in terms of a data requirement without affecting its strength or reliability, Whereas, in many cases, the unavailability, insufficiency and inconsistency of data act as a serious constraint and a limiting factor to the development of many models.
4. Factors of production can also be integrated in this model, which in turn allows for some policy instruments in factor markets to be analyzed.
5. The relationships between commodities in model may be a very important feature of the model, and are usually considered through cross prices effects.
6. The market equilibrium analysis also plays a central role in the welfare evaluation of technical change and of government pricing or regulatory policy (Chavas *et al*., 1996).

### 3.14.1 Data sources

To achieve the objectives of the study, secondary data was collected for production, domestic consumption, and trade of the four major export crops of the Sudan. The major export crops of the Sudan are cotton, sesame, gum Arabic, and groundnut. Data collected for these crops covered the period from 2004-2014. The period of 2004-2014 was chosen as it represents the only complete available data up to year 2018. Data collected was first used to describe the current situation of the production, domestic consumption and trade of the selected crops. The average production, domestic consumption, exports, and prices for the

major export crops during the period 2004-2014 was used to represent the base year for the analysis after signing the EPA by the Sudan.

The data was obtained from different institutional sources, including the Department of Agricultural Economics and Statistics of the Ministry of Agriculture and Forestry, the Ministry of Finance and Economic Planning, the Central Bank of Sudan, the Custom Administration of the Sudan Custom Police, and Department of the Economic Partnership Agreement (EPA) of the Ministry of Foreign Trade and other relevant sources.

The collected data include: Total production and domestic consumption and the exports of agricultural crops, producer prices, consumer prices, and border prices of agricultural export crops. The producer prices used here are the average producer prices of the individual commodities produced at different agricultural sectors (irrigated, mechanized, or traditional sector) obtained from the Ministry of Agriculture and Forestry. Consumer price is net of consumer subsidies or taxes if any. Border price used in the model is the export unit value (export value divided by export quantity) or import unit value (import value divided by import quantity) depending on the net trade status of the product. Published and unpublished studies, reports and statistic include form and relevant institutions to the study topics. The data sources also included published research from universities and research centers.

### 3.14.2 Conceptual framework and general nature of the model

There are many different approaches in the use of the models for policy analysis. Quizon and Binswanger (1986) developed an approach, which proceeds first with a rigorous estimation of both the complete

producer core and compete system of final demand using a trans log profit function., Another approach, associated with Braverman and Hammer (1986), consists in specifying only equations and exogenous variables of subsets of interest in the procedure core and using "best guesses" to quantify the necessary elasticity's instead of using econometric estimation. While the first approach has the advantage of econometric validation, the second has the advantage of giving quickly consist results for complex policy issues. However, Sadoulet and Janvry (1995) argued, the two approaches are not exclusive and should be viewed as mutually reinforcing. Other approaches like consistency frameworks approach (extensively used by the FAO), mathematical programming approaches and multilevel planning models have also been used to perform quantitative policy analysis at sector level (Throbecke and Hall, 1982).

The model approach extends the analysis of prices and non-price policy instruments from the analysis of their impact in commodity - or factor – specific partial equilibrium models to the infractions among markets on both the product and factor side (Sadoulet and de Janvry, 1995).

The model is a comparative static approach. In a static framework, one can analyze how changes in government policies or in world markets affect the supply and demand relations in each region, and how changes in supply and demand modify the trade balance (Abdel Karim, 2002).

The general nature of the model is iterative, i.e. it allow for the simultaneous determination of supply, demand, trade levels and prices

including their cross-market linkages for all commodities covered. Fundamentally, the model is a price equilibrium model.

### 3.14.3 Description of the model for the Sudan

The model includes four agricultural tradable products namely, cotton, gum Arabic, sesame, groundnuts. The modeled commodities are the main agricultural products of the Sudan. The model is covered total agricultural exports to the EU countries and quantity exported to the rest of the world.

As agriculture is the main sector of Sudan's economy, the model is extended to explicitly integrate some of the key important macro-economic components of national income, balance of trade and balance of payments, and to establish certain feedback effects between agriculture and the micro economy.

The model used is based like many classical trade models on the assumptions of perfect competition (i.e. producers and consumers are price takers) and homogeneity of products (i.e. intra-industry trade is not shown by the model. In addition, the small country assumption is employed for all commodities covered by the model. This means the share of Sudan in international agricultural trade is small and probably domestic changes will not influence world market prices. Therefore, and the rest of the world are included in the model by means of simple representation of fixed world market prices for Sudan's exports and imports. The small country assumption might not be valid in the case of gum Arabic where Sudan is the main producer. However, to avoid complexity the small country case is applied for all covered commodities.

### 3.14.4 Structure and calibration of the model

#### 3.14.4.1 Specification of the baseline model

A baseliner or base year model is developed to serve as a benchmark or a reference to contrast variations that are to be investigated in this study. The baseline model uses the data from 2004-2014 as base year, and is based on the assumption that there are no changes in agricultural policy prevailed in the base year.

#### 3.14.4.2 Calibration

There are two approaches for numerical specification of the model represented by calibration methods or econometric estimations. Calibration is most commonly used, while econometric estimation is rarely used (Hassan and Hallam, 1996). Calibration, the approach adopted hereafter, considers principally only one data point to compute system parameters.

Model calibration is a critical part of the baseline development process. The parameters of the supply and demand are calibrated to reproduce a given base period (2004-2014). In this model structure, supply and demand functions were calibrated for their constant terms. The supply and demand functions used are derived from reduced form Cobb-Douglas function (Kirschke *et al*., 1996; Jechlistschka, 1997). This function simplifies analysis and provides plausible approximation of the real world.

Supply and demand equations are solved for the constant terms by using the initial values of producer prices, the quantities supplied and elasticity's in the base period. Then, the calibrated equations were used in

further analysis for deriving price and quantity effects as well as welfare changes.

### 3.14.4.3 Solving the model

The system of equation is, then solved using the excel solver, which is capable of solving a system of non-linear equations. The solver solves the model as an optimization or programming model. Generally, all the solved equations in the model are simultaneous and the model is consequently solved jointly for all the endogenous variables. In the solver, one of the equation cells is specified as target cell and others as constraints. When the objective function is solved for zero value, the model generates optimal values for all prices and factors of production and outputs of commodities included in the model at the point where the market is in equilibrium. These values represent the production and consumption levels of the economy modeled.

## 3.15 Development of Different Policy Scenario

The previous sections were mainly concerned with the formulation of the model for different selected agricultural commodities in the Sudan under the prevailing economic conditions applicable to 2004-2014. In this section, zero tariffs scenario is developed in order to model the expected different effects of the EPA on Sudan's agricultural trade.

Zero tariffs scenario a possible image of future events, like a policy strategy to pursue (Hermanides and Nijkamp, 1998). Scenario analysis can also be an important tool when long-term uncertainties are concerned. Uncertainty refers to situations where it is not possible to attach a probability to the occurrence of events. The likelihood is neither

knows by the decision-maker nor by anyone else (Ellis, 1992). The following scenarios are investigated:

### 3.15.1 Baseline scenario (B)

The baseline scenario replicates production, consumption and policy conditions prevailed in the base period. B is used as a reference for the subsequent simulated scenario.

### 3.15.2 EPA zero tariff scenario (SI)

This scenario is done by removal of border taxes (tariffs) from products of trading partners.

# CHAPTER FOUR

# RESULTS AND DISCUSSION

## 4.1 Production and Trade of the Sudan's Agricultural Products before Applying the EPA Conditions by the EU

The Sudan foreign trade policy during the period 2004-2014 aimed at increasing non-oil exports of cotton, sesame, gum Arabic, groundnuts and other export products. In addition the policy intended to improve the competitiveness of exports in general and open new markets. Agricultural products represent the major export items of the Sudan to the EU countries. The value of agricultural export crops (cotton, sesame, gum Arabic, groundnuts) to the EU declined from US$ 862.8 million in 2004 to US$ 677.3 million in 2014, a decrease of 3.2%. This was a result of the decrease in the export value of groundnuts by 50% and sesame by 2.8%, despite the slight increase in the value of cotton, gum Arabic exports. The value of cotton exports increases from US$ 34.0 million in 2004 to US$ 93.75 million in 2014 an increase of 14.7%, due to the increase in cotton prices. The value of sesame exports decreased from US$ 466.3 million in 2004 to US$ 178.6 million in 2014, due to the decrease in the quantities exported to EU from 472.4 metric tons in 2004 to 218.34 metric tons in 2014. The value of gum Arabic exports increased from US$ 60.60 million in 2004 to US$ 97.4 million in 2014 an increase of 15.5%, due to an increase in the quantities exported of gum Arabic from 35.42 metric tons in 2004 to 37.904 metric tons in 2014, the value of aground nuts export declined from US$ 13.3 million in 2004 to US$ 6.0 million in 2014 a decrease of 50%, due to decrease in the exported

quantities to EU from 2.400 metric tons in 2004 to 451.0 million in 2014 metric tons. Sudan's exports to the (EU) countries occupied a leading position on the customers list on average of 381. % of agricultural exports, and the major items exported to the (EU) are raw materials particularly cotton, sesame, gum Arabic and groundnuts.

Since 1999 the oil and byproduct became among the most important exports of Sudan. In 2006 the exports of oil and its byproducts constituted 89.9 percent of total exports, while the agricultural exports with the agrarian and animal sub-section ranked second followed by the manufactured materials such as sugar and minerals the most important of gold (Bank of Sudan, Annual Report).

The Asian non-Arabic countries remained the key market for the Sudanese exports during the last eight years. The direct of Sudan's exports and the percentage of total export the group of Asian non-Arabic countries constituted the largest market for the Sudanese exports, in 2004, which amounted to 82.4% of total exports.

The values of Sudanese exports to the Arab countries increased considerably to US$ 429.9 million. Exports to (EU) countries increased to US$ 174.3 million. Countries of European Union (EU) ranked as the third importer with total value of imports amounting to 2.7% and the other European countries with a total value of imports amounted to 0.4% of total Sudanese exports. In2006thevalue of the agricultural exports to the Arab countries witnessed an increase as their values by 9.7% of total exports compared to 7.8% in 2005. Exports to the (EU) countries declined to 27.2%. The European countries topped the list of countries importing Sudanese goods with a total value of 18%, followed by the United Kingdom and other

European countries with a total value by 0.3% in 2006 and 0.1% in 2005, of the total value of exports. In 2006-2007, the group of Asian non-Arabic countries constituted the largest market for the Sudanese exports which is 91.9% of the value of exports compared to 86.1% in 2007-2008. The value of Sudanese exports to the Arab countries witnessed a decreased in value by 4.1% of the total exports compare to 8.0% in 2006(Bank of Sudan, Annual Report, 2008).

Exports to the (EU) countries increased by 2.1% in 2007, from the total of Sudanese exports compared to 1.8% in 2006.The (EU) countries topped the list of countries importing Sudanese goods with a total value of 1.7%, followed by the United Kingdom 0.3%, and also the other European countries by 0.1% of the total value of the exports. In 2008, the group of Asian non-Arabic exports reached 10,541.5 million in 2008, by the 90.2% compared to the previous year. In 2008, the value of agricultural exports to the Arab countries increased by the 6.1% of the total exports compared to 4.1% in the previous year (2007). The value of agricultural exports to the COMESA countries declined by 0.6% in 2008, compared to 1.0% in 2007. The Sudanese exports to the European countries decreased to 1.6% of the total exports, compared to 2.1% in 2007, and (EU) countries topped the list of countries importing Sudanese goods with a total value of 1.4% in 2008 (Bank of Sudan, Annual Report).

## 4.2 The Potential Implications of Zero Tariffs Scenario s1 by the EU on Production and Trade Agricultural Products

The potential changes that may occur to the production, domestic consumption, and trade of each of the major export crops of the Sudan after applying zero tariffs by the EU were analyzed using Armington

model. The average production, domestic consumption, and trade quantities and values of the major export crops of the Sudan during the period 2004-2014 were assumed to represent the base year. This will allow seeing what changes can occur between a base and a scenario of a year after applying zero tariffs on imports from the Sudan by the EU countries. Imports from the Sudan by the EU countries face tariffs of 20 percent [(1)]. Comparison will be done between the situations in the base year before the application of zero tariffs and the scenario which reflect the situation after applying zero tariffs on imports from the Sudan by the EU. Armington model was applied to see the changes that will be happened to production, domestic consumption, and trade of the major agricultural exports cotton, sesame, gum Arabic, groundnuts and the reflection of these changes on welfare in the Sudan, after the removal of the tariffs on the imports of these crops by the EU countries.

### 4.2.1 Cotton

Cotton is the one of the most important items in the export list and in hard currency earnings of the Sudan. Cotton output in the base year was 2,200.6 million thousand bales compared to 2,206.36 million thousand bales in the zero tariffs year scenario after apply EPA niles, an increase of 1 percent in the production of cotton in the Sudan, and this was due to the fluctuations in the international prices. At the same time total exports of cotton increased from 2,033.8 million thousand bales in the base year to 2,053.3 million thousand bales in the zero tariffs scenario year, an increase of almost by 1 percent, due to the increase in the average of the international prices despite, and also is

(1) The Custom Administration of the Sudan Custom Police (2007).

due to the increase in the cotton quantity exported of the Sudan. The domestic producer price and consumer price decreased by 1 percent and 48 percent respectively after applying zero tariffs on imports from Sudan to the EU countries, and this was due to the drop in the international prices. Domestic demand of cotton decreased from 166.8 million thousand bales in the base year to 153.06 million thousand bales in the zero tariffs year scenario, a decrease of 0.9 percent, this is due to the fluctuations in the production of cotton and cultivated area. Total exports of cotton to the EU increased from 449.3 million thousand bales in the base year, to 480.1 million thousand bales in the zero tariffs year scenario, an increase of 1 percent, this is due to the an increase in the exported quantity of the Sudan from 27,273 million thousand bales in 2004 to 59,730 million thousand bales in 2014. Exports of cotton to the rest of the world decreased from 1584.5 million thousand bales in the base year, to 1573.2 million thousand bales in the zero tariffs year scenario, a decrease of 0.99 percent, this is due to the larger part of quantity exports of cotton go to the EU markets (Table 4.1).

Table (4.1): A comparison between the cotton quantity export to EU situations in the base year and the zero tariffs year after the applying EPA niles.

| | Base year (000s bales) | Zero tariff Scenario (000s bales) | Percentage Change |
|---|---|---|---|
| Aggregate output | 2200.6 | 2206.36 | 1 |
| Domestic demand | 166.8 | 153.06 | -0.9 |
| Export to EU | 449.3 | 480.1 | 1 |
| Export to Row | 1584.5 | 1573.2 | -0.99 |
| Total export | 2033.8 | 2053.3 | 1 |

Source: Armington model results.

A comparison between cotton welfare indicators in the base year and zero tariffs year scenario is depicted in (Table 4.2) below. As a result of the zero tariffs applied on imports from the Sudan by the EU

countries, the producer's surplus of cotton exported increased from 2048.5 (m. $) in the base year, to 2075.9 (m. $) in the zero tariffs year scenario, an increase of 1.0 percent, and this is due to the an increase in the total aggregate output of cotton quantity. The consumer surplus of cotton exported decreased from 6259.9 (m. $) in the base year, to 6153.7 (m. $) in the zero tariffs year scenario, a decrease of 0.98 percent, this decline due to the increase in the average of the international prices. The net welfare of cotton after applying zero tariffs on imports from the Sudan by the EU countries was negative is an amount of 0.95 percent, due to the application of zero tariffs nile between the Sudan and EU.

Table (4.2): A comparison between the cotton welfare indicators in the Sudan in the base year and the zero tariffs year after the applying EPA niles.

| | Producer surplus | Consumer surplus | Net welfare |
|---|---|---|---|
| Base year values (m. $)* | 2048.5 | 6259.9 | 8097.9 |
| Scenario year values (m. $)* | 2075.9 | 6153.7 | 7710.2 |
| Percentage change (%) | 1.0 | -0.98 | -0.95 |

Source: Armington model results. * Million US. $.

### 4.2.2 Sesame

Sesame is the major seed oil crop, and is produced mainly in the rainfed sub-sector in Gadarif, Damazin and Kordofan and to a lesser extent in Darfur and Bahar El Ghazal areas in both the mechanized and traditional sub-sectors. It is exported as white and brown or mixed sesame seeds. White sesames secure higher prices, brown and mixed seeds are used mainly for oil (Limia, 1994). Sesame output in the base year was 2222.74 metric tons compared to 2360.8 metric tons in the zero tariffs year scenario after applying EPA niles, an increase of 1.06 percent in the production of sesame in the Sudan, this is due to

the an increase in the sesame total exports of the Sudan . At the same time total exports of sesame increased from 2055.5 metric tons in the base year to 2245.4 metric tons in the zero tariffs scenario year, an increase of almost by 1.0 percent, This is due to the fluctuations in the production of sesame and cultivated area . The domestic producer price and consumer price decreased by 163 percent and 77 percent respectively after applying zero tariffs on imports from Sudan to the EU countries, this was due to the fluctuations in the international prices of the sesame crop. Domestic demand of sesame decreased from 166.74 metric tons in the base year to 115.4 metric tons in the zero tariffs year scenario, a decrease of 0.69 percent, this is due to the fluctuations in the quantities exported of sesame from Sudan. Total exports of sesame to the EU countries increased from 160.5 metric tons in the base year, to 624.7 metric tons in the zero tariffs year scenario, an increase of 3.89 percent; this is due to the removal of tariffs f between the Sudan and the EU after applying EPA nile. Exports of sesame to the rest of the world decreased from 1895 metric tons in the base year, to 1620.7 metric tons in the zero tariffs year scenario, a decrease of 0.85 percent, as due to the a larger part of quantity exports of sesame go to the EU countries (Table 4.3).

Table (4.3): A comparison between the sesame quantity export to EU situations in the base year and the zero tariffs after the applying EPA niles.

| | Base year (000s sm.t) | Zero tariffs scenario (000s sm.t) | Percentage change |
|---|---|---|---|
| Aggregate output | 2222.24 | 2360.8 | 1.06 |
| Domestic demand | 166.74 | 115.4 | -0.69 |
| Export to EU | 160.5 | 624.7 | 3.89 |
| Export to Row | 1895 | 1620.7 | -0.85 |
| Total export | 2055.5 | 2245.4 | 1.0 |

Source: Armington model results.

A comparison between sesame welfare indicators in the base year and zero tariffs year scenario is depicted in (table 4.4) below. As a result of the zero tariffs applied on imports from the Sudan by the EU countries, the producer's surplus of sesame exported increased from 2051.3 (m.$) in the base year, to 2097.5 (m.$) in the zero tariffs year scenario, an increase of 1.02 percent, due to the an increase in the sesame quantity exported of the Sudan. The consumer surplus of sesame exports decreased from 6360 (m. $) in the base year, to 6135 (m. $) in the zero tariffs year scenario, a decrease of 0.96 percent, this decline due to the increase in the average of the international prices. The net welfare of sesame after applying zero tariffs on imports from the Sudan by the EU countries was negative is an amount of 0.95 percent, as results of the application of the EPA.

Table (4.4): A comparison between the sesame welfare indicators in the Sudan in the base year and the zero tariffs year after the applying EPA niles.

| | Net welfare | Consumer surplus | Producer surplus |
|---|---|---|---|
| Base year values (m. $)* | 2051.3 | 6360 | 8045.9 |
| Scenario year values (m. $)* | 2097.5 | 6135 | 7698.3 |
| Percentage change (%) | 1.02 | -0.96 | -0.95 |

Source: Armington model results. * Million US. $.

### 4.2.3 Gum Arabic

Gum Arabic is a non-wood forest product plays an important role in both domestic and foreign trade. Sudan is a leading producer of gum Arabic supplying around two third of the total world consumption of this crop (Abdel Nour, 1999). Gum Arabic output in the base year was 598.04 metric tons compared to 618.20 metric tons in the zero tariffs year scenario after the applying EPA niles, an increase of 1.03

percent in the production of gum Arabic in the Sudan, This was attributed to the lately adopted government policy of deregulating monopoly of the gum Arabic Co. Ltd and enters of other companies and individuals in purchase and sale of gum Arabic which encouraged the producers to increase their production. At the same time total exports of gum Arabic increased from 431.3 metric tons in the base year to 443.5 metric tons in the zero tariffs scenario year, an increase of almost by 1.02 percent, this is due to the increase in the quantity exported of the Sudan, of gum Arabic . The domestic producer price and consumer price decreased by 65 percent and 87 percent respectively after applying zero tariffs on imports from Sudan to the EU countries, due to the increase in the average international prices despite. Domestic demand of gum Arabic decreased from 166.74 metric tons in the base year to 174.7 metric tons in the zero tariffs year scenario, a decrease of 10.4 percent, this is due to the fluctuations in the quantities exported of gum Arabic from the Sudan. Total exports of gum Arabic to the EU countries increased from 202.7 metric tons in the base year, to 256.7 metric tons in the zero tariffs year scenario, an increase of 1.26 percent; this is due to the removal of tariffs f between the Sudan and the EU after applying EPA. Exports of gum Arabic to the rest of the world decreased from 228.6 metric tons in the base year, to 186.8 metric tons in the zero tariffs year scenario, a decrease of 0.81 percent, as larger part of quantity exports of gum Arabic go to the EU countries (Table 4.5).

Table (4.5): A comparison between the gum Arabic quantity export to EU situations in the base year and the zero tariffs after the applying EPA niles.

| | Base Value (000s sm.t) | Zero tariffs scenario (000s sm.t) | Percentage Changes |
|---|---|---|---|
| Aggregate output | 598.04 | 618.2 | 1.03 |
| Domestic demand | 166.74 | 174.7 | -1.04 |
| Export to EU | 202.7 | 256.7 | 1.26 |
| Export to Row | 228.6 | 186.8 | -0.81 |
| Total export | 431.3 | 443.5 | 1.02 |

Source: Armington model results.

A comparison between gum Arabic welfare indicators in the base year and zero tariffs year scenario is depicted in table (4.6). As a result of the zero tariffs applied on imports from the Sudan by the EU countries, the producer's surplus of gum Arabic exported increased from 472.3 (m. $) in the base year, to 477.3 (m. $) in the zero tariffs year scenario, an increase of 1 percent, and this is due to the an increase in the total aggregate output of gum Arabic quantity of the Sudan. The consumer surplus of gum Arabic exported decreased from 1687.9 (m. $) in the base year, to 1557.3 (m. $) in the zero tariffs year scenario, a decrease of 0.92 percent, this decline due to the increase in the average of the international prices. The net welfare of gum Arabic after applying zero tariffs on imports from the Sudan by the EU countries was negative is an amount of 0.58 percent, as results of the application of the EPA.

Table (4.6): A comparison between the gum Arabic welfare in the Sudan indicators in the base year and the zero tariffs year after applying EPA niles.

| | Producer Surplus | Consumer surplus | Net welfare |
|---|---|---|---|
| Base year values (m. $)* | 472.3 | 1687.9 | 3308 |
| Scenario year values (m. $)* | 477.3 | 1557.3 | 1936 |
| Percentage change (%) | 1.0 | 0.92 | -0.58 |

Source: Armington model results. * Million US. $.

### 4.2.4 Groundnuts

Groundnuts, is the second major oil crop, it is important as foreign exchange earnings as well as it satisfies domestic consumption for cooked nuts and for processing for oil. It is produced mainly in the irrigated sub-sector (Gezira, Rahad, Schemes) as well as in the traditional rain-fed agricultural sub-sector. Groundnut output in the base year was 62.93 metric tons compared to 62.682 metric tons in the zero tariffs year scenario after applying EPA niles, an increase of 0.99 percent in the production of groundnuts in the Sudan, this is due to the an increase in the groundnuts total exports of the Sudan . At the same time total exports of groundnuts increased from 62.7 metric tons in the base year to 62.33 metric tons in the zero tariffs scenario year, an increase of almost by 0.99 percent, this is due to the increase in the quantity exported of the groundnuts of the Sudan . The domestic producer price and consumer price decreased by 53.7 percent and 29.4 percent respectively after applying zero tariffs on imports from Sudan to the EU countries, due to the increase in the average international prices despite . Domestic demand of groundnuts decreased from 0.23 metric tons in the base year to 0.352 metric tons in the zero tariffs year scenario, a decrease of 1.53 percent, this is due to the fluctuations in the quantities exported of the groundnuts of the Sudan. Total exports

of groundnuts to the EU countries increased from 8.4 metric tons in the base year to 49.63 metric tons in the zero tariffs year scenario, an increase of 5.90 percent, this is due to the removal of tariffs between the Sudan and the EU after applying EPA. Exports of groundnuts to the rest of the world decreased from 54.3 metric tons in the base year, to 12.7 metric tons in the zero tariffs year scenario, a decrease of 0.23 percent, as larger part of quantity exports of groundnuts go to the EU countries table (4.7).

Table (4.7): A Comparison between the groundnuts quantity export to EU situations in the base year and the zero tariffs after the applying EPA niles.

| | Base year (000s sm.t) | Zero tariffs scenario (000s sm.t) | Percentage Changes |
|---|---|---|---|
| Aggregate output | 62.93 | 62.682 | 0.99 |
| Domestic demand | 0.23 | 0.352 | -1.53 |
| Export to EU | 8.4 | 49.63 | 5.90 |
| Export to Row | 54.3 | 12.7 | -0.23 |
| Total export | 62.7 | 62.33 | 0.99 |

Source: Armington model results

A comparison between groundnuts welfare indicators in the base year and zero tariffs year scenario is depicted in table (4.8) below. As a result of the zero tariffs applied on imports from the Sudan by the EU countries, the producer's surplus of groundnuts exported increased from 33.3 (m. $) in the base year, to 62.9 (m. $) in the zero tariffs year scenario, an increase of 1.88 percent, and this is due to the an increase in the total aggregate output of groundnuts quantity of the Sudan. The consumer surplus of groundnuts exported decreased from 17.34 (m. $) in the base year, to 195.7 (m. $) in the zero tariffs year scenario, and decrease of 11.2 percent, this decline due to the increase in the average

of the international prices. The net welfare of groundnuts after applying zero tariffs on imports from the Sudan by the EU countries was negative is an amount of 1.76 percent, as results of the application of the EPA and applying zero tariffs.

Table (4.8): A comparison between the groundnuts welfare indicators in the Sudan in the base year and the zero tariffs year after the applying EPA niles.

| | Producer surplus | Consumer surplus | Net welfare |
|---|---|---|---|
| Base year values (m. $)* | 33.3 | 17.34 | 110.9 |
| Scenario year values (m. $)* | 62.9 | 195.7 | 195.2 |
| Percentage change (%) | 1.88 | 11.2 | 1.76 |

Source: Armington model results. * Million US. $.

## 4.3 Sensitivity Analysis

In the Armington model, to check robustness of the model results according to the elasticity used in the base line scenario, first elasticity (20%) set is decreased by 10% and then increased by 10% from their absolute base values. Tables (4.9) to (4.16) show the results of sensitivity analysis of zero tariff scenarios.

Table (4.9) shows the percentage changes of cotton quantities sensitivity analysis, the lower response for the elasticity changes is shown on the aggregate output of cotton and they change from 1% to 3% and the elasticity change of the cotton domestic demand changed from 1% to 4%, while the cotton elasticity change of the export to EU it changed from 27% to 20% but the cotton elasticity change of the export to the rest of the world it changed from 3% to 2%, at the same time the cotton total export elasticity change it shown lower response from 1% to 2%.

Table (4.9): Percentage changes of cotton quantities traded after applying EPA when using different elasticity options.

| | Zero tariff results | (+10%) elasticity | (-10%) elasticity |
|---|---|---|---|
| Aggregate output | 1 | 3 | 1 |
| Domestic demand | 6 | 4 | -1 |
| Export to EU | 92 | 20 | 27 |
| Export to row | 4 | 2 | -3 |
| Total export | 9.7 | 2 | 1 |

Source: Armington model results.

Table (4.10) shows the percentage changes of the sensitivity analysis of the cotton net welfare indicators, consumer surplus elasticity of cotton shows the largest response and they change from 1% to 3% and producer surplus elasticity of cotton they change from 2% to 8%.

Table (4.10): Percentage changes of cotton net welfare for the Sudan after EPA application.

| | Producer Surplus | Consumer surplus | Net Welfare |
|---|---|---|---|
| Zero tariff results | 102 | 1 | 95 |
| (+10%) elasticity | 2 | 9 | 1 |
| (-10%) elasticity | 0.08 | 1 | 0.03 |

Source: Armington model results.

Table (4.11) shows the percentage changes of sesame quantities, the lower response for the elasticity changes is shown on the aggregate output of sesame and they change from 1% to 4%. and the elasticity change of the sesame domestic demand changed from 1% to 2%, while the sesame elasticity change of the total export to EU it changed from 20% to 27% but the sesame elasticity change of the export to the rest of the world it changed from 3% to 6%, at the same time the sesame total export elasticity change it shown response from 10% to 14%.

Table (4.11): Percentage changes of sesame quantities traded after applying EPA when using different elasticity options.

| | Zero tariff results | (+10%) elasticity | (-10%) elasticity |
|---|---|---|---|
| Aggregate output | 106 | 4 | 1 |
| Domestic demand | 125 | 1 | -2 |
| Export to EU | 150 | 20 | 27 |
| Export to row | 85.5 | 3 | 6 |
| Total export | 109 | 10 | 14 |

Source: Armington model results.

Table (4.12) shows the percentage changes of the sensitivity analysis of the sesame net welfare indicators, consumer surplus of sesame shows the largest response and they change from 2% to 1% and producer surplus of sesame they change from 3% to 2%.

Table (4.12): Percentage changes of sesame net welfare for the Sudan after EPA application.

| | Producer Surplus | Consumer surplus | Net Welfare |
|---|---|---|---|
| Zero tariff results | 102 | 96 | 3 |
| (+10%) elasticity | 3 | -2 | 1 |
| (-10%) elasticity | 2 | 3 | 2 |

Source: Armington model results.

Table (4.13) shows the percentage changes of gum Arabic quantities, the lower response for the elasticity changes is shown on the aggregate output of gum Arabic and they change from 2% to 2% and the elasticity change of the gum Arabic domestic demand changed from 2% to 3%, while the gum Arabic elasticity change of the export to EU it changed from 15% to 13% but the gum Arabic elasticity change of the export to the rest of the world it changed from 11% to 12%, at the same time the gum Arabic total export elasticity change it shown lower response from 6% to 7%.

Table (4.13): Percentage changes of gum Arabic quantities traded after applying EPA when using different elasticity options.

| | Zero tariff results | (+10%) elasticity | (-10%) elasticity |
|---|---|---|---|
| Aggregate output | 103 | 3 | 2 |
| Domestic demand | 76 | 6 | -7 |
| Export to EU | 110 | 13 | 15 |
| Export to row | 82 | -11 | -12 |
| Total export | 103 | 6 | 7 |

Source: Armington model results.

Table (4.14) shows the percentage changes of the sensitivity analysis of the gum Arabic net welfare indicators, consumer surplus elasticity of gum Arabic shows the largest response and they change from 3% to 2% and producer surplus elasticity of gum Arabic they change from 4% to 2%.

Table (4.14): Percentage changes of gum Arabic net welfare for the Sudan after EPA application.

| | Producer Surplus | Consumer surplus | Net Welfare |
|---|---|---|---|
| Zero tariff results | 101 | 92 | 58 |
| (+10%) elasticity | 4 | 2 | 2 |
| (-10%) elasticity | 2 | 3 | 3 |

Source: Armington model results.

Table (4.15) shows the percentage changes of groundnuts the aggregate output of groundnuts and they change from 3% to 5% and the elasticity change of the groundnuts domestic demand changed from 8% to 13%, while the groundnuts elasticity change of the export to EU it changed from 10% to 12% but the groundnuts elasticity change of the export to the rest of the world it changed from 14% to 15%, at the same time the groundnuts total export elasticity change it shown lower response from 8% to 9%.

Table (4.15): Percentage changes of groundnuts quantities traded after applying EPA when using different elasticity options.

| | Zero tariff results | (+10%) elasticity | (-10%) elasticity |
|---|---|---|---|
| Aggregate output | -1 | 5 | 3 |
| Domestic demand | 12 | -8 | 13 |
| Export to EU | 15 | 10 | 12 |
| Export to row | 23 | 15 | -14 |
| Total export | 2 | 8 | 9 |

Source: Armington model results.

Table (4.16) shows the percentage changes of the sensitivity analysis of the groundnuts net welfare indicators, consumer surplus elasticity of groundnuts shows the largest response and they change from 6% to 3% and producer surplus elasticity of the groundnuts they change from 4% to 3%.

Table (4.16): Percentage changes of groundnuts welfare for the Sudan after EPA application.

| | Producer Surplus | Consumer surplus | Net Welfare |
|---|---|---|---|
| Zero tariff results | 189 | 11 | 176 |
| (+10%) elasticity | 4 | 4 | 6 |
| (-10%) elasticity | 3 | 4 | 3 |

Source: Armington model results.

The lower response for the elasticity changes is shown on the aggregate output of all commodities covered by the model (cotton, sesame, gum Arabic, and groundnuts) and domestic demand.

Generally, the model shows, sensitivity analysis has no affect the results of the model, while aggregate trade indicators are relatively more sensitive to the lower elasticity values than upper values, whereas application of zero tariffs indicators are relatively more sensitive to the upper case elasticity values than lower case values.

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Summary and Conclusions

Exports of Sudan are dominated by petroleum and agricultural products in the form of raw materials. The proportion of agricultural exports in total exports varied from year to year, depending on production levels, world prices and level of petroleum exports revenues. An agricultural export plays a predominant role and driving force in the Sudanese economy (Egaimi, 2004).

Sudan is the largest country in Africa in terms of size-over 2.5 million square kilometers – and has diversified geography, ecology and demography. With a population of 37 million in 2006, Sudan is one of the most sparsely populated countries in the world. However, despite trade liberalization and notable economic progress in recent years, Sudan's abundant natural resources remained under utilized and its trade potential is largely unexploited. Since the start of commercial exploitation of oil in August 1999, the economy of Sudan moved from high dependence on agriculture to heavy dependence on oil with little genuine economic transformation, but agriculture remains the main source of employment and income for the majority of the population. Political factors - particularly civil wars - and policy mistakes often combine to slow the country's progress towards accelerated and sustained growth and improved living standards (World Bank, 2007).

The general objective of this study is to assess the potential implications and the impact of signing the Economic Partnership Agreement (EPA) with EU on the Sudan agricultural trade relationship and the Specific objectives are to describe the Economic Partnership Agreement (EPA) and Sudan current status as regard to the agreement.

More ever to estimate the EPA effects especially on agricultural trade exports of specific of the Sudan with the EU and the rest of the world and to study the estimate of the potentials impact of EPA on domestic production and consumption of agricultural commodities of the Sudan and to explore the estimate of the potentials impact of EPA on producer surplus, consumer surplus and net welfare of agricultural production of Sudan and to draw from the study some policy recommendations for the Sudan to deal with EPA implications, and suggest some areas for future research. To achieve the objectives of the study, secondary data was collected for production, domestic consumption, and trade of the four major export crops of the Sudan. The major export crops of the Sudan are cotton, sesame, gum Arabic, and groundnut. Data collected for these crops covered the period from 2004-2014. In the second part Armington model is employed to achieve the study objectives, the model is a useful tool in analyzing a number of various agricultural and international trade issues. The Armington model assumption says that final goods internationally traded are differentiated on the basis of the country of origin. The model was used to estimate the impacts of Economic Partnership Agreement mainly application of zero tariffs scenario on the Sudan's agricultural trade, and then to estimate the impact applying of the EPA between the Sudan and the EU and also the

impacts of the application of zero tariffs on production, domestic consumption, producer and consumer prices, producers and consumers surplus, net welfare and impacts on the rest of the world are simulated.

The general nature of the Armington model allows for simultaneous determination of supply, demand, producer and consumers surplus, welfare, for all commodity under the study. The study covered the most important agricultural exports to the EU markets namely, gum Arabic, sesame, cotton and groundnuts. Scenarios analysis was used to evaluate different changes results of the study showed that zero tariffs scenario has positive impacts on producer and domestic agricultural production, while the study showed the improvement on the producer surplus, consumer surplus and net welfare in some cases. Also, the implementation of the EPA will redirect agricultural exports of the Sudan towards the EU markets, rather than the rest of the world. Sudan needs to look at any expected negative impacts of the EPA on the domestic markets.

In order to maximize the benefits from EPA and increase the investments on the Sudanese agricultural and increase the contribution of trade to the economic development in general, Sudan needs to design and implement more effective agricultural policies than it has done in the past. Clearly efforts need to be intensified on all fronts for Sudan to improve its export performance and for trade to play a more significant role in the economic and social development of the country. These efforts include domestic policy as well as regional and international cooperation framework at the macroeconomic level. While government stabilization policy should be maintained, more innovative strategies

need to be introduced in order to increase public as well as private investment in infrastructure especially in energy, roads and education. The implementation of the EPA will redirect agricultural exports of Sudan towards the EU markets, and this will impose more pressures on quality assurance and standards in order to comply with the EU market regulation.

## 5.2 Recommendations

The agricultural sector is the leading sector in the Sudanese economy. The importance of the sector is manifested in being the main source of income for the public sector, and the majority of the population.

In order to maximize the benefits from EPA and increase the investments on the Sudanese agricultural trade and increase the contribution of trade to the economic development in general, Sudan needs to design and implement more effective agricultural policies than it has done in the past.

Sudan need to build competitive marketing strategies to prefer local producers for the anticipated competition by EU imports. Sudan should consider giving subsidies to farmers and local producers in order to enhance their productive capacities which decrease production costs thereby undermining the competiveness at both domestic and foreign markets. Obviously Sudan needs to diversify its trade in terms of composition of exports and trading partners.

The study recommended that the application of the EPA has positive impacts on Sudan’s agricultural output, exports and foreign

exchange earnings. Also, the implementation of the EPA will redirect agricultural exports of the Sudan towards the EU markets, rather than the rest of the world. Sudan needs to look at any expected negative impacts of the EPA on the domestic markets.

The application of the EPA has positive impacts on Sudan's agricultural aggregate output, exports and foreign exchange earnings. Also, the implementation of the EPA will redirect agricultural exports of Sudan towards the EU markets, and this will impose more pressures on quality assurance and standards in order to comply with the EU market regulation. In order to maximize the benefits from the EPA Sudan must increase investments, design and implement more effective policies in agricultural sector to raise productivity, improve quality and competitiveness. Also, Sudan need to take care of expected negative impacts of the EPA on the domestic markets.

From the study, the implementation of the EPA by the Sudan it takes an improvement on the producer surplus, consumer surplus and net welfare of the agricultural production of the Sudan. Application of the zero tariffs by the EU on agricultural commodities for the Sudan will increase trade benefits of the Sudan, for this reason Sudan should pay more attention about the implementation of the EPA. Sudan need to draw from the study some policy recommendations to deal with EPA implications.

The study concluded that the Sudan need to pay attention to the implementation of the EPA in order to encourage trade integration of its market with the EU and to benefit from the potential growth of its trade with EU markets.

# REFERENCES


Abdel Karim, I. (2002). The Impact of the Uruguay Round Agreement on Sudan Agricultural Trade, Published Ph.D. Dissertation, Berlin. Humboldt University.

Abdoulaye, B. (1994). ACP Development, Integration and the Capacities of Transport Infrastructure: The Missing Link. In Faber, G and Orbie J. (eds.) Beyond Market Access for Economic Development: EU-Africa Relations in Transition. London and New York. Routedge. Taylor and Francis Group.

Ake, C. (1981). The Political Economy of Africa. Harlow, Essex. Longman.

Ake, C. (1994). Democratization of Disempowerment in Africa. Lagos. Malthouse Press.

Amin, S. (1976). Un-Equal Development, An Essay on the Social Formations of Peripheral Capitalism. England, Harvester Press .

Amin, S. (1988). Class and Nation, Historically and in the Current Crisis. New York. Monthly Review Press.

Andre,G. Frank. (1978). Assessing the Economic Impacts of an Economic Partnership Agreement on Nigeria. Policy Research Paper 4920. World Bank.

Armington, P.S. (1969). A theory of demand for products distinguished by place of production, international monetary fund staff papers, VoI. 16, pp. 159-76.

Baran, P. (1968). Political Economy of Growth. New York. Monthly Review Press.

Bartels, L. (2007). The WTO Legality of the EU's GSP+ Program. www.worldtradelaw.net.

Ben Hammouda, H., Karriqi, E, Ouedrago, B, Swalch, I., Oulmano, N. and Jallabo, M., (2006). Assessing the Consequences of the Economic Partnership Agreement (EPA) on the Economy Seychelles, Unpublished ATPC paper, Uneca. Addis Ababa, Ethiopia.

Bhagwati, J. (1985). The New International Economic Order, Cambridge MA: MIT Press.

Biel, R. (2000). The New Imperialism: Crisis and Contradictions in North/South Relations. London and New York. Zed Books.

Bradley, N. and Bradley, W. (2010). Is the EU's Governance 'Good'? An Assessment of EU's Governance in Its Partnership with ACP States". Third World Quarterly. 31: 1 Pp 31-49.42.

Brenton, P. Dihel, N., Hinkle, L. and Strychacz, N. (2010). Africa's Trade in Services and the Opportunities and Risks of Economic Partnership Agreements. Africa Trade Policy Notes N6. World Bank. September.

Brown, W. (2000). Restructuring North-South Relations. ACP-EU Development Cooperation in a Liberal International Order" Review of African Political Economy, 27 (85): pp 373-375.

Braverman, A. and Hammer, J. (1986). Multi-market Analysis of Agricultural Pricing Policies in Senegal. In Agricultural Household models: Extensions, Application and Policy, edited by I. Singh et al. Baltimore: John Hopkins University Press.

Campling, L. (2008). Fisheries Aspects of ACP-EU Interim Economic Partnership Agreements: Trade and Sustainable Development Implications. ICTSD Series on Fisheries, Trade and Sustainable Development. Issue Paper No 6. ICTSD. Geneva, Switzerland.

Cardoso, F. and Faletto, E. (1979). Dependency and Development in Latin America, transl. Marjory Mattingly Urquidi. Berkeley and Los Angeles. University of California Press.

Chang, H.J. (2002). Trade and Industrial Policy Issues" in Chang H-J (ed.) Rethinking Development. London. Wimbledon Publishing Company.

Chang H. and Grabel, I. (2004) Reclaiming Development: An Alternative Economic Policy Manual. London and New.

Chavas, J. and Thomas, L. (1996). On Market Equilibrium Analysis of Wisconsin-Madison. Staff Paper No. 393.

Dixit, P., McDonald, B. and Roningen, V. (1992) Supplying Quantitative Analysis of Agriculture in the Uruguay Round. Atlantic Economic Society Best Paper Proceedings 2: 85-89.

Dornbusch, R. and Fisher, S. (1981). Macroeconomics. Second Edition. International Student Edition, McGraw-Hill International Book Company.

Egaimi, A. (2004). Agricultural policies of Sudan and areas of coordination with agricultural policies of Arab countries. Meeting of senior officers in the field of agricultural policies. Arab League, Cairo (Arabic).

EIU, Economist intelligences Unit (2007). Sudan: Country report, EIU, London, UK.

European Commission (2005). How Economic Partnership Agreements benefits both consumers and producers in Europe and developing countries.

European Parliament, (2006). The European Consensus on Development. Brussels.

European Center for Development Policy Management (ECDPM), (2008). WTO and EPA Negotiations for an enhanced coordination of ACP positions on Agriculture.

Limia, K.S. (1994). Prices policies and prospects of sesame export in Sudan. Unpublished M.Sc. Thesis, Sudan, University of Khartoum.

Lioyd, P.J. and Zhag, X.G. (2006). The armington model, productivity commission staff working paper, Melboune, January.

Loo, T. and Tower, E. (1990). Agricultural Liberalization, Welfare, Revenue and Nutrition in Developing Countries. In Agricultural Trade Liberalization Implication for Developing Countries. Edited by I. Goldin and O. Knudsen. Paris: OECD and World Bank Proceedings 2:85-89.

Faber, G. and Orbie, J. (2009). New Dynamics in EU-ACP Relations: The Genesis of EPAs in Faber, G and Orbie J. (eds.) Beyond Market Access for Economic Development: EU-Africa Relations in Transition. London and New York. Routedge. Taylor and Francis Group.

Francois, J. and Reinert, K. (1997) Applied Methods for Trade Policy Analysis. A Handbook, published by Cambridge University Press, United Kingdom.

Gilpin, R. (2000). The Challenge of Global Capitalism in the 21st Century. Princeton. N.J. Princeton University Press.

Goldin, I. and Knudsen, O. (1990). Agricultural Trade Liberalization: Implications for Developing Countries. OECD, Paris.

Hartmann, M., Hoffmann, M., and Schmitz., P. M. (1994). Allokations and Vertilungswirkungen der EG-Agrarreform. In: Landwirtschaftliche Rentenbank (Hrsg.): Verteilungswirkungen der kunftigen EU-Agrarpolitik nach der Agrarrform. Schriftenreihe Bank8, Frank furt am Main.

Harvey, D. (2007). A Brief History of Neo Liberalism. London. Oxford University Press.

Hassan, A., and Hallam, A. (1996). Macroeconomic Linkages to Agriculture: A general Equilibrium Model for Sudan. In Journal of Agricultural Economics 47 (1): 60-88.

Hoekman, B. and Mattoo, A. (2008). Services Trade and Growth. Policy Research Working Paper 4461. The World Bank.

Hoogvelt, A. (2011) Globalization and the Post-Colonial World. The New Political Economy of Development. Second Edition. Baltimore. John Hopkins University Press.

Hurts, S. (2003). Cooperation and Coercion? The European Union and ACPStates and the End of the Lomé Convention. Third World Quarterly. Vol. 24. No.1. pp 161-176.

Hurts, S. (2010). Understanding EU Development Policy: history, global context and self-interest?, Third World Quarterly, 31: 1, 159-168.

.Meier, G. (1984). Pioneers in Development Economics. New York. Oxford University Press.

Ministry of Agriculture and Forestry (2008). Department of Agricultural Economics Year book of Agricultural Statistic, Khartoum, Sudan.

Ministry of Foreign Trade (2008). Economic Partnership Agreement (EPA) between the EU and ACP countries.

MOF, Ministry of Finance (2005). Economic survey, Khartoum, Sudan.

Nabudere, D. (1975). The Lomé Convention and the Consolidation of Neo-Colonialism. Dares Salam. F.U.E African Studies.

Jechlitschka, K., und Lotze, H. (1997). Theorie und Anwendung eines Mehr-Market-Modells Zur sektoralen Analyse Von Agrapolitiken fuer Agrarinformatik.

Kirschke, D., Jechlitschka, K., Noleppa, S. und Lotze, H. (1996). Uberlegungen und Beispielrechnungen fur ein Modell zur Simulation von Marketentwicklung und Agrarpolitik im Oblast Tula. Projekt: Agrarpolitische und betriebswirtschaftliche Beratung Tula 728-RUS.-94-13.

Onimode, B. (1988). A Political Economy of the African Crisis: London. Zed Books.

Oxfam (2006). Unequal Partners: How EU-ACP Economic Partnership Agreements (EPAs). Could Harm the Development Prospects of Many of the World's Poorest Countries. Oxfam, Briefing Note. UK.

Rey, C. (1996). Rise and Fall of Development Theory. London. James Currey Limited.

Rodney, M. (1981). The Enlarged European Union and the Developing World: What Future?, in Mold, A, (ed.) EU Development Policy in a Changing World: Challenges for the 21st Century. Amsterdam: Amsterdam University Press.

Rostow, W.W. (1990). The Stages of Economic Growth. A Non-Communist Manifesto, Cambridge. Cambridge University Press.

Quizon, J., and Binswanger, H. (1986). Modeling the Impact of Agricultural Growth and Government Policy on Income Distribution in India. World Bank Economic Review I: 101-48.

Sadoulet. E. and Janvery, A. (1995). Quantitative Development Policy Analysis. John Hopkin University Press, Baltimore and London.

Sachs, J. and Warner, A. (1995). Economic Reforms and the Process of Global Integration. Brookings Economic Activity. No. 1 South Centre, (2010). Analytical Note. May.

Samir, A. (1990). Quantitative Development Policy Analysis. John Hopkins University Press, Baltimore and London.

Spero, J. and Hart, J. (2010). Australia and United States: Wadsworth Cengage Learning. Stiglitz J. (Post Washington Consensus) in A. Atkinson*et al* (eds.) WIDER Perspectives on Global Development. New York. Palgrave Macmillan.

South Centre (2010). Analytical Note. May.

Stiglitz J. (2005) (Post Washington Consensus) in A. Atkinson et al (eds.) WIDER perspectives on Global Development. New York. Palgrave Macmillan.

Tandon, Y. (2010). EPA: New Trade Deals, Old Agendas" Pambazuka, issue 502. Available athttp://www.pambazuka.org/ en/category/ features/68109. accessed October, 28, 2010.

Thorbecke, E. and Hall, L. (1982). Nature and Scope of Agricultural Sector Analysis: An Overview. In Agricultural Sector Analysis and Models in Developing Countries. Edited by E. Thorbecke, and L. Hall. Rome: Food and Agricultural Organization of the United Nation, Policy Analysis Division.

Todaro, M. and Smith, S. (2008). Economic Development. London, Pearson Addison Wesley.

Wallerstein, I. (1988). Modern World System. New York. New York Academic Press.

Wallerstein, I. (1979). The Capitalist World Economy. Cambridge. Cambridge University Press.

Williamson, J. (1990). What Washington Means by Policy Reform", in Williamson, J. (ed.) Latin American Adjustment: How Much Has Happened? Institute for International Economics 1990.

World Bank (2007). Sudan country brief 2007, the World Bank, Washington, DC, USA.

# APPENDICES

Appendix (4.1): Quantity exports of cotton to EU (2004-2014) (Quantity in 000s m.t.)

| Year | Quantity exported | Quantity exported to EU | Percentage of EU (%) |
|---|---|---|---|
| 2004 | 354.617 | 56.892 | 16.0 |
| 2005 | 456.614 | 40.713 | 9.0 |
| 2006 | 482.492 | 39.769 | 8.3 |
| 2007 | 268.521 | 23.472 | 9.0 |
| 2008 | 139.426 | 20.276 | 14.5 |
| 2009 | 86.856 | 256.0 | 0.30 |
| 2010 | 32.525 | 2.432 | 7.5 |
| 2011 | 6.243 | 6.186 | 99.0 |
| 2012 | 13.383 | 2.2.0 | 1.6 |
| 2013 | 260.536 | 1.960 | 0.75 |
| 2014 | 99.374 | 1.38 | 1.4 |

Source: Bank of Sudan Annual Reports (various issues).

Appendix (4.2): Quantity exports of sesame to the EU (2004-2014)

| Year | Quantity exported | Quantity exported to EU | Percentage of EU (%) |
|---|---|---|---|
| 2004 | 318.336 | 26.975 | 8.5 |
| 2005 | 154.675 | 7.644 | 5.0 |
| 2006 | 219.047 | 7.196 | 3.3 |
| 2007 | 111.798 | 4.349 | 3.4 |
| 2008 | 96.774 | 14.903 | 15.4 |
| 2009 | 137.659 | 6.527 | 5.0 |
| 2010 | 227.137 | 9.162 | 4.0 |
| 2011 | 211.826 | 7.222 | 3.4 |
| 2012 | 208.916 | 14.821 | 7.0 |
| 2013 | 239.458 | 23.903 | 10.0 |
| 2014 | 299.71 | 37.786 | 12.6 |

Source: Bank of Sudan Annual Reports (various issues).

Appendix (4.3): Quantity exports of gum Arabic to EU (2004-2014)
(Quantity in 000s m.t.)

| Year | Quantity exported | Quantity exported to EU | Percentage of EU (%) |
|---|---|---|---|
| 2004 | 27.273 | 12.847 | 47.0 |
| 2005 | 29.213 | 14.822 | 50.0 |
| 2006 | 20.618 | 11.286 | 55.0 |
| 2007 | 30.875 | 13.094 | 42.5 |
| 2008 | 32.217 | 16.402 | 51.0 |
| 2009 | 237.009 | 16.659 | 7.0 |
| 2010 | 18.20 | 16.609 | 91.3 |
| 2011 | 45.63 | 22.404 | 49.0 |
| 2012 | 36.35 | 15.59 | 43.0 |
| 2013 | 60.34 | 31.705 | 52.5 |
| 2014 | 59.73 | 31.285 | 52.3 |

Source: Bank of Sudan Annual Reports (various issues).

Appendix (4.4): Quantity exports of groundnuts to the EU (2004-2014)

| Year | Quantity exported | Quantity exported to EU | Percentage of EU (%) |
|---|---|---|---|
| 2004 | 3.182 | 2.400 | 75.0 |
| 2005 | 2.324 | 3.094 | 93.0 |
| 2006 | 343.0 | 244.0 | 71.0 |
| 2007 | 1167.0 | 791.0 | 68.0 |
| 2008 | 842.0 | 385.0 | 46.0 |
| 2009 | - | - | - |
| 2010 | 227.0 | - | - |
| 2011 | 13.85 | 107.0 | 0.8 |
| 2012 | 6.667 | - | - |
| 2013 | 28.192 | 919.0 | 3.0 |
| 2014 | 5.888 | 451.0 | 8.0 |

Source: Bank of Sudan Annual Reports (various issues).