UNIVERSITI PUTRA MALAYSIA

ASSESSING COMPETITIVENESS OF LIVE SHEEP EXPORT IN SELECTED STATES IN SUDAN USING POLICY ANALYSIS MATRIX

ELSEDIG ELBADAWI AHMED AWAD

IKDPM 2012 2
ASSESSING COMPETITIVENESS OF LIVE SHEEP EXPORT IN SELECTED STATES IN SUDAN USING POLICY ANALYSIS MATRIX

By

ELSEDI EWAD ELBADAWI AHMED AWAD

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

December 2012
DEDICATIONS

To my beloved father Elbadawi, mother Laila, brothers, sisters, my sincere wife Sara and beloved son Mohammed
Abstract of thesis presented to the senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

ASSESSING COMPETITIVENESS OF LIVE SHEEP EXPORT IN SELECTED STATES IN SUDAN USING POLICY ANALYSIS MATRIX

By

ELSEDIG ELBADAWI AHMED AWAD

December 2012

Chairperson: Professor Fatimah Mohamed Arshad, PhD

Institute: Institute of Agriculture and Food Policy Studies

The agriculture sector in Sudan, like in most developing countries, plays an important role in the country’s economic development, functioning as food supplier, employment and export earning and a source of raw materials for the other industries. It contributed 49.8 percent to the Gross Domestic Product (GDP) in 1999 and had declined to 30.1 percent in 2009. The livestock sector represents an important and integral component of the agriculture exports. Its share in the country’s GDP was 20.9 percent in 2002 and it dropped to 16 percent in 2009. The livestock share in the total agriculture exports dropped around 59 percent from US$ 83 million in 2002 to US$ 49 million 2008. The major objective of this study is to evaluate the competitiveness of sheep export in three
selected states in Sudan, which are Khartoum, Gadarif and North Kordofan. Other objectives are to measure the comparative advantage and to provide policy recommendations to improve the competitiveness of sheep export in Sudan. The study employed secondary and primary data, which was collected in 2010. The Policy Analysis Matrix (PAM) was applied to determine the competitiveness and policy effects. The Nominal Protection Coefficient (NPC) and Effective Protection Coefficient (EPC) were used to analyse the policy effects. While the Domestic Research Cost (DRC) was used to determine the comparative advantage. The findings of this study illustrate the analysis of private profitability which shows that sheep of all sizes generate profit. The government interventions on sheep’s production in terms of taxes have negative impact on the competitiveness of sheep export in the selected states. Financially, the highest profit recorded in North Kordofan which is SDG 80.23 per head. The results of DRC indicator suggest that Sudan enjoys comparative advantage in production of sheep in selected states. North Kordofan has proven to be more effective in saving the foreign exchange, followed by Khartoum and Gadarif. The study recommends that the Government has to revise the tax structure, improve infrastructures and logistics, increase supportive measures (R&D to improve productivity), provides incentives and seeks markets to improve the competitiveness of sheep exports.
Abstrak tesis yang dikemukakan kepada senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

MENILAI DAYA SAING EKSPORT KAMBING BIRI-BIRI DI NEGERI TERPILIH DI SUDAN MENGGUNAKAN MATRIKS ANALISIS POLISI

Oleh

ELSEDIG ELBADAWI AHMED AWAD
Disember 2012

Pengerusi: Profesor Fatimah Mohamed Arshad, PhD
Institut: Kajian Dasar Pertanian dan Makanan

Sektor pertanian di Sudan, seperti di negara-negara membangun yang lain, memainkan peranan yang penting dalam pembangunan ekonomi iaitu ia menyediakan, bekalan makanan, peluang pekerjaan, pendapatan eksport dan bahan mentah untuk industri berasaskan pertanian. Pada tahun 1999, sektor ini telah menyumbang sebanyak 49.8% kepada Keluaran Dalam Negara Kasar (KDNK) namun, menjelang 2009 sumbangannya menurun kepada 30.1%.

Penternakan haiwan komponen utama ekspor pertanian Sudan. Sedekad yang lalu, syer ekspot yang disumbangkan oleh penternakan dalam KDNK menurun daripada 20.9% pada tahun 2002 kepada hanya 16% pada tahun 2009. Syer

bahawa pihak kerajaan sewajarnya; mengecualikan pengeluaran biri-biri
daripada cukai memandangkan sektor ini merupakan komoditi yang strategik,
memperbanyakkan pemberian insentif bagi menggalakkan pengeluaran
kambing biri-biri dan mengekalkan dan kestabilan pertukaran wang asing dan
membuka pasaran antarabangsya yang baru untuk mengelakukan masalah pada
masa akan datang.
ACKNOWLEDGEMENT

All the praises and thanks are for Almighty Allah Subhanahu Wa Taala. Whose countless bounties enabled me to accomplish this study, and by the grace of His Holy Prophet Mohammed (peace be upon him) who is forever a source of enlightenment, guidance and knowledge for humanity as a whole.

I express my sincere appreciation and deep sense of gratitude to my Major Supervisor Professor Dr. Fatimah Mohamed Arshad, my advisory committee members, Professor Dr. Zainal Abidin Mohamed and Professor Dr. Mohd Mansor Ismail, for their invaluable guidance, tremendous supports, encouragement, suggestions and criticisms throughout the course of the thesis research. Grateful appreciation also extended Dr. Amna Awad Abedl Hameed and Hassb Alrasoul Yousif for their wonderful comments, support and suggestions.

I wish to thank the UPM’s staffs, colleagues and friends in Malaysia especially at the Institute of Agricultural and Food Policy Studies, UPM, who have extended assistance to me whenever needed throughout my stay, especially my friends Gasim, Ibrahim Hussien, Mohammed Ibrahim and Ali Abdegadir.
I will forever be grateful and be indebted to my affectionate parents, brothers and sisters for their blessings and encouragement. They have always motivated me to accomplish my goals.

I am greatly to my wife Sara and my beloved son Mohammed for their support, encouragement, patience and sacrifices especially during the last year of my thesis completion.

Last but not least, I would like to express my deepest gratitude to the Government of Sudan in particular the Economic and Social Research Bureau, Ministry of Science and Technology, Dr. Abdulaziz Ahindi, Amal Khalil and all the staffs in the National Center for Training Ministry of Labour, Public Service and Human Resource and Development.
I certify that a thesis Examination Committee has met on 18th December 2012 to conduct the final examination of Elsedig Elbadawi Ahmed Awad on his thesis entitled “Assessing Competitiveness of Live Sheep Export in Selected States in Sudan Using Policy Analysis Matrix” in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A)106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

Member of the thesis Examination Committee were as follows:

**Ismail AbdLatif, PhD**  
Associate Professor  
Faculty of Agriculture  
Universiti Putra Malaysia  
(Chairperson)

**Alias Radam, PhD**  
Associate Professor  
Faculty of Economics and Management  
Universiti Putra Malaysia  
(Internal Examiner)

**Amin Mahir Abdullah, PhD**  
Associate Professor  
Faculty of Agriculture  
Universiti Putra Malaysia  
(Internal Examiner)

**Bustanul Arifin, PhD**  
Professor  
Universiti Lampung, Indonesia  
(External Examiner)

______________________________
SEOW HENG FONG, PhD  
Professor and Deputy Dean  
School of Graduate Studies  
Universiti Putra Malaysia  
Date:
This thesis was submitted to the senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory committee were as follows:

**Fatimah Mohamed Arshad, PhD.**
Professor
Institute of Agricultural and Food Policy Studies
Universiti Putra Malaysia
(Chairperson)

**Zainalabidin Mohamed, PhD.**
Professor
Faculty of Agriculture
Universiti Putra Malaysia
(Member)

**Mohd Mansor Ismail, PhD.**
Professor
Institute of Agricultural and Food Policy Studies
Universiti Putra Malaysia
(Member)

______________________________
BUJANG BIN KIM HUAT, PhD
Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date:
DECLARATION

I declare that the thesis is my original work except for quotations and citations, which have been, duty acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other Institution.

____________________________________
ELSEDIG ELBADAWI AHMED AWAD

Date: 18 December 2012
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEDICATION</td>
<td>i</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>ii</td>
</tr>
<tr>
<td>ABSTRAK</td>
<td>iii</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>iv</td>
</tr>
<tr>
<td>APPROVAL</td>
<td>v</td>
</tr>
<tr>
<td>DECLARATION</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>viii</td>
</tr>
<tr>
<td>LIST OF ABBREVIATION</td>
<td>ix</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td></td>
</tr>
<tr>
<td>1.1 Background</td>
<td>1.1</td>
</tr>
<tr>
<td>1.2 Agriculture in Sudan</td>
<td>1.1</td>
</tr>
<tr>
<td>1.3 Sheep Industry in Sudan</td>
<td>1.4</td>
</tr>
<tr>
<td>1.3.1 Sheep Production in Sudan</td>
<td>1.6</td>
</tr>
<tr>
<td>1.3.2 Agricultural Policy</td>
<td>1.8</td>
</tr>
<tr>
<td>1.3.3 Live Sheep Export</td>
<td>1.9</td>
</tr>
<tr>
<td>1.4 Problem Statement</td>
<td>1.11</td>
</tr>
<tr>
<td>1.5 Objectives of the Study</td>
<td>1.13</td>
</tr>
<tr>
<td>1.6 Significance of the Study</td>
<td>1.15</td>
</tr>
<tr>
<td>1.7 Organization of the Study</td>
<td>1.16</td>
</tr>
<tr>
<td>2. LIVESTOCK INDUSTRY IN SUDAN</td>
<td>1.17</td>
</tr>
<tr>
<td>2.1 Introduction</td>
<td>2.1</td>
</tr>
<tr>
<td>2.2 The Structure of the Sudanese Economy</td>
<td>2.2</td>
</tr>
<tr>
<td>2.2.1 Agricultural Sector</td>
<td>2.2</td>
</tr>
<tr>
<td>2.2.1.1 Traditional Rain-fed Sub-sector</td>
<td>2.3</td>
</tr>
<tr>
<td>2.2.1.2 Mechanized Rain-fed Sub-sector</td>
<td>2.3</td>
</tr>
<tr>
<td>2.2.1.3 Irrigated Sub-sector</td>
<td>2.4</td>
</tr>
<tr>
<td>2.2.1.4 Forestry Sub-sector</td>
<td>2.5</td>
</tr>
<tr>
<td>2.2.1.5 Livestock and Fisheries Sub-sectors</td>
<td>2.5</td>
</tr>
<tr>
<td>2.2.2 Manufacturing Sector</td>
<td>2.6</td>
</tr>
<tr>
<td>2.2.3 Services Sector</td>
<td>2.7</td>
</tr>
<tr>
<td>2.3 Sheep Industry in Sudan</td>
<td>2.7</td>
</tr>
<tr>
<td>2.3.1 Livestock Production System</td>
<td>2.8</td>
</tr>
<tr>
<td>2.3.2 Animal Feed Sources</td>
<td>2.13</td>
</tr>
<tr>
<td>2.3.3 Transportation</td>
<td>2.15</td>
</tr>
</tbody>
</table>
5. RESULT AND DISCUSSION 5.1 Profile of Respondents 5.1.1 Producers 5.1.1.1 Producers in Khartoum 5.1.1.2 Producers in Gadarif 5.1.1.3 Producers in North Kordofan 5.1.2 Wholesaler 5.1.2.1 Wholesaler in Khartoum 5.1.2.2 Wholesaler in Gadarif 5.1.2.3 Wholesaler in North Kordofan 5.1.3 Exporters 5.1.3.1 Exporters in Khartoum 5.1.3.2 Exporters in Gadarif 5.1.3.3 Exporters in North Kordofan 5.1.4 Farm Characteristics 5.1.5 Marketing System 5.1.5.1 Domestic Sheep Marketing 5.1.5.2 The Division of Labor within Market Channels 5.1.5.3 Market Flows 5.1.5.4 Market Infrastructure 5.1.6 Sheep Marketing Channel 5.1.6.1 Primary Markets 5.1.6.2 Secondary Markets 5.1.6.3 Terminal Markets 5.1.6.4 Market Actors 5.1.6.4.1 Ghelaja (Bush Traders)
5.1.6.4.2 Sebbaba (Local Brokers) 2.34
5.1.6.4.3 Jellaba (Suppliers) 2.34
5.1.6.4.4 Damin (Guarantor) 2.36
5.1.6.4.5 Wakil (Agent) 2.37

5.2 Measures of Competitiveness of Sheep in Sudan 5.38
5.2.1 Absolute Competitiveness 5.38
5.2.1.1 Producer Profitability 5.38
5.2.1.2 Social Economics Profitability 5.39
5.2.1.3 International Value Added 5.43

5.2.2 Relative Competitiveness 5.44
5.2.2.1 Domestic Resource Cost 5.44
5.2.2.2 Coefficient of International Competitiveness 5.46
5.2.2.3 Nominal Protection Coefficient 5.47
5.2.2.4 Effective Protection Coefficient 5.49
5.2.2.5 Social Cost Benefit 5.51
5.2.2.6 Producer Subsidy Equivalent 5.52
5.2.2.7 Subsidy Ratio to Producer 5.53
5.2.2.8 Profitability Coefficient 5.54

5.3 Sensitivity Analysis 5.55
5.4 Profitability Exporter 5.58

6. CONCULATION AND RECOMMENDATION 6.1
6.1 Conclusion 6.1
6.2 Result and Discussion 6.3
6.3 Limitations of Study and Suggestions of Future Research 6.7
6.4 Recommendation 6.8

REFERENCES R1
APPENDICES A1
BIODATA OF STUDENT B
LIST OF PUBLICATION P