TRADE STRUCTURE AND PATTERN OF WOOL AND MOHAIR EXPORT OF LESOTHO

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Abstract

Trade structure and pattern of Lesotho's wool and mohair sub-sector were analyzed using 4 digits Standard International Trade Classification (SITC) of wool and Mohair and different trade indicators from 2003-2012. Revealed Comparative Advantage (RCA), Hirschman Index (HI), Effective Rate of Protection (ERP) and Nominal Rate of Protection (NRP) were calculated. Trade map was also used to assess the diversification of wool and mohair markets. The study revealed that Lesotho have a Revealed Comparative Advantage (RCA) of wool and mohair sub-sector from 2003 to 2012. Hirschman Index (HI) indicated that wool and mohair sub-sectors shows low concentration from 2003 to 2012. Lower concentration reduces the impact of international trade risk due to the possibility of price fluctuation of wool and mohair products. ERP and NRP were also calculated, using an enterprise budget of Lesotho for wool and mohair production. The result shows that the ERP and NRP shows negative which indicate that the weighted input tariffs on wool and mohair inputs amount are more than the output tariffs, this implies that the sub-sector is taxed by the government tariff policies. The NRP is higher than the ERP; this implies that tariff applied on the output is higher than the tariff applied on the inputs. The results from the trade map indicated that Lesotho's wool and mohair have high degree of concentration in China and South Africa. The structure of the tariff schedule may have an important bearing on efficiency. Thus, the study recommended that the tariff structure of the input sector for wool and mohair should be reinvestigated and Lesotho should be diversifying its market of wool and mohair.

Keywords: Wool and Mohair, Revealed comparative advantage index, Hirschman index, Effective rate of protection, Nominal rate of protection

1. Introduction

Lesotho is committed to the implementation of World Trade Organization (WTO) agreements, which include liberalization of trade. Lesotho is signatory to a variety of trade agreements which afford expanded access to regional and international markets, and trade agreements are to expand market access for goods and services. It is also involved in the Cotonou agreement which is the most comprehensive partnership agreement between developing countries and the European countries (Rakoto, 2011).

Wool and mohair are the main agricultural exports, and Lesotho is the world's second producer of mohair after South Africa, it produces 14 percent of mohair produced globally (Rath *et al*., 2014). In Lesotho more than 28,000 smallholder producers have their sheep and goats shorn, 1.2 million sheep and 500,000 goats were shorn and their fleeces were marketed on the international market.

Marketing of Lesotho's wool and mohair is unique for smallholder producers. Individual smallholder producers are marketing most of their fleece wool directly on a major international auction market at Port

Elizabeth and Durban in South Africa, where wool and mohair is primarily handled by marketing agent Boeremakelaars Koöperatief Beperk (BKB) (IFAD, 2014).

There is a well-developed and effective value-chain for the production and marketing of wool and mohair. Figure 1 indicates Lesotho wool and mohair value chain which consists of associations that use or link with the government shed, the other one is individual farmers that link with private traders and the third is marginal groups that use informal market channel. From these three links wool and mohair is sold at auctions in South Africa where wool and mohair will be absorbed and processed. Other wool and mohair are re-exported to the international market.

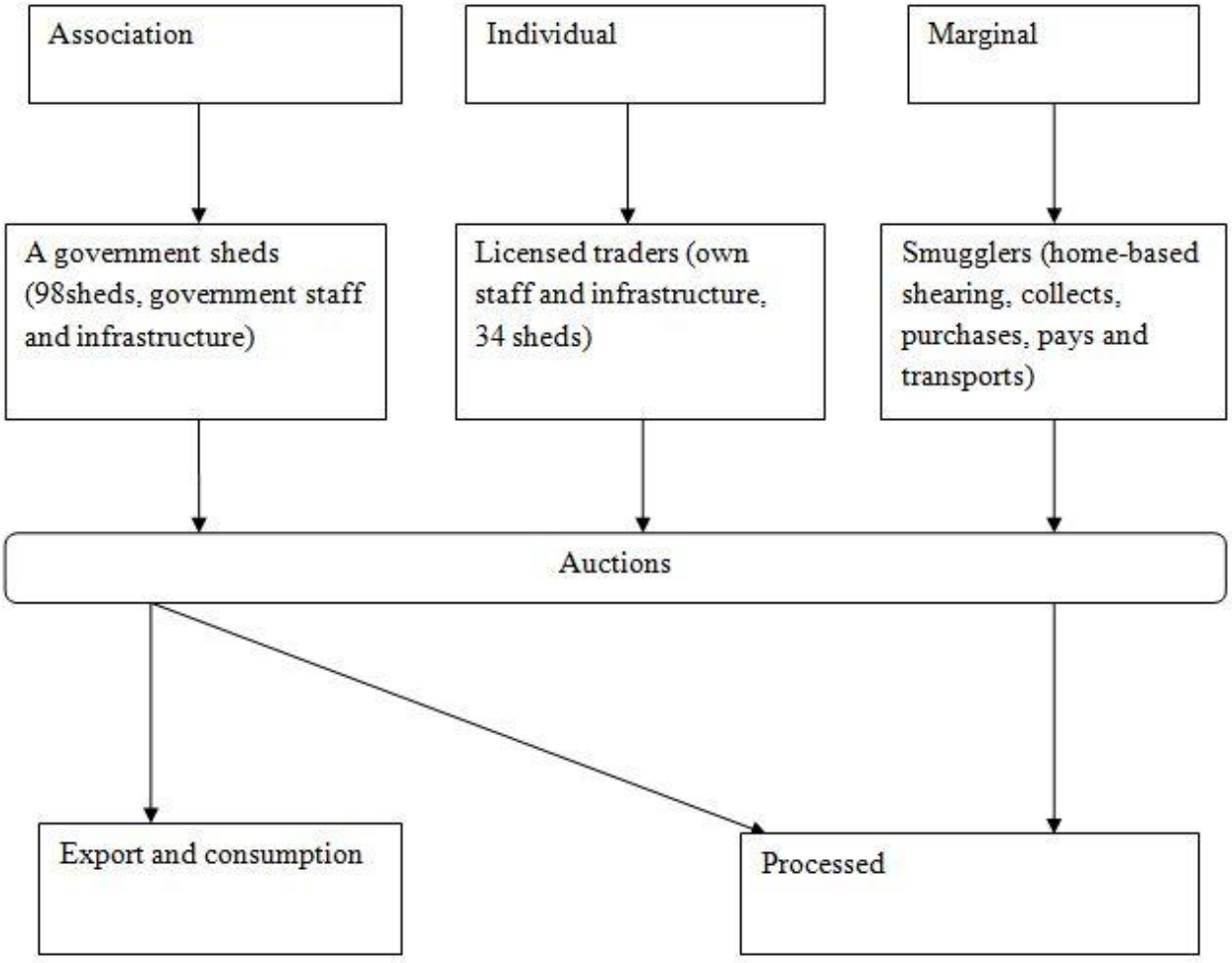

Figure 1: Lesotho wool and mohair value chain.
Source: Tregurtha (undated)

During the 2012/2013 season Lesotho's wool and mohair produced and exported was 3 599 794 kilograms and 472 132 kilograms respectively. The production of wool and mohair has increased due the increase of the number of sheep and goats shorn (BKB, 2013).

Constraints to the production of wool and mohair are: inappropriate range management practices, lack of supplementary feeding, low quality of sheep due to poor cross breeding husbandry practices, inadequate disease control measures, inclement weather, long term declining terms of trade that have affected the major wool exporters of the world and taxation of the sub-sector (Department of Livestock Services, 2013).

The significance of the wool and mohair sub sectors in Lesotho economy is undeniable. To answer the questions appertaining to the effect of trade policy on the wool and mohair sub sectors is vitally important. The world has witnessed a rapid spread of economic regionalism and integration, especially in the last two decades. One of the most visible outputs from this expansion is the proliferation of Free Trade Agreements (FTAs) among nations. The Lesotho government engaged in a large number of FTAs. These conditions create a need to critically evaluate the role of trade policy in the wool and mohair sub sectors.

The main objective of the study is to analyze trade structure and pattern of wool and mohair of Lesotho uses the trade map and applies theoretical and empirical principles of RCA, HI, ERP, NRP to better understand the structure and pattern of wool and mohair export in Lesotho.

2. Methodologies and data used

The Lesotho agricultural trade at 4-digit standardized international trade classification (SITC) level is used for the trade structure and pattern analysis; it includes two groups of agricultural commodities which are wool and mohair. The data sources are the Ministry of Trade, Industry Cooperatives and marketing (2014), Lesotho Bureau of Statistics (2014), International Trade Centre (2014), United Nations Commodity Trade (UNCOMTRADE) (2014), Central Bank of Lesotho (2014) and the Ministry of Agriculture and Food Security (2014). In order to calculate the Balassa Effective Rate of Protection (ERP) and Nominal Rate of Protection (NRP) an enterprise budget developed for the calendar year of 2013/2014. The economic price of wool and mohair were calculated by giving due consideration to the shadow value of the exchange rate, transportation cost, Insurance and Freight (CIF), import parity, export parity price as well as tariffs imposed on inputs.

Indicators can and should be used towards evidence-based policy-making. In an effort to analysis of trade structure and pattern of wool and mohair export commodities of Lesotho different methodologies was employed. The study will use the trade maps, apply theoretical and empirical principles of Revealed Comparative Advantage (RCA), Effective Rate of Protection (ERP) and Nominal Rate of Protection (NRP); Hirschman Index (HI) used to better understand a pattern of production and trade of wool and mohair in Lesotho.

In 1965, Bela Balassa introduced the notion of revealed comparative advantage as a way to approximate comparative advantage in self-sufficiency. Balassa and others have used consumption, import and export data to conduct various trade performance indicators. The revealed comparative advantage (RCA) indexes of Bela Balassa are well known, the difference between the two indexes lies in the fact that one of them includes only exports whereas the other include both exports and imports (Bahta *et al.,* 2013 and Leishman *et a*l., 2013).

The formula to calculate Balassa RCA index is:

$$RCA_{i} == \frac{\frac{X_{ij}}{\sum_{i} x_{ij}}}{\frac{\sum_{j} x_{ij}}{\sum_{i}\sum_{j} x_{ij}}}$$

Where: X_{ij} is the total exports of sector "i" of country "j"

$\sum_{i} x_{ij}$ is the total export of country "j"

$\sum_{j} x_{ij}$ is the world exports of sector "i" and

$\sum_i \sum_j x_{ij}$ is the total "world" export

This index measures a specific product's share in the country's total export relative to a share of this product in the world trade. When the product's share in the world export (RCA >1), interpret it as the country revealed comparative advantage in this particular product. In contrast, for products whose (RCA< 1), country is said to reveal comparative disadvantage. Often this index is interpreted as RCA in production of product.

ERP is the commonly used measure of net effect of trade policies on the incentives facing domestic producers. The measurement of effective protection is clearly a two- stage process- firstly, determining the nominal protection of the policies in question, secondly, analyzing the implications for effective protection of different firms, sectors or activities (Reed, 2001).

ERP is a measure of how tariff structure affects value added in an industry. ERP measure has been widely used both by governments to determine the level of protection to provide to domestic industries and by international organizations such as the World Bank, the Organization for Economic Co-operation and Development (OECD), and the World Trade Organization in trade policy negotiations (Diakantoni and Escalth, 2012).

ERP expressed as:

$$ERP = \frac{VA^d - VA^w}{VA^w} \times 100$$

Where: VA^d is value added in the activity as measured at protection –Inclusive domestic prices

VA^w is value added in the activity as measured at undisorted world prices

The NRP is an estimation of the equivalent tariff that would lead to the total disparity between domestic and international prices, over and beyond the known price- raising effect of the import tariff. NRP is derived from the difference between the domestic price of a good and the observable world price of a comparable good (USAID, 2008).

NRP expressed as:

$$P^d = P^W (1 + t + d + e)$$

$$NPR = \frac{P^d - P^w}{P^w} \times 100$$

Where: P^d is domestic price
P^w is world price
t is ad valorem equivalents of taxes
d is duties on imports of good
e is the net ad valorem tariff equivalent of other non-tax, Non- tariff trade Restrictions

HI index is a measure of market concentrate named after ORRIS Herfindahl, who applied the index in his doctoral dissertation in 1950 and Albert Hirschman who presented the index in a book in 1945. The index is widely used measure of market diversification and market concentration (Chen and Godager, 2011).

HI is calculated as:

$$HI = \sqrt{(\sum (X_i / x)^2)}$$

Where: X_i is value of product i's export

X is value of total export of country

The lower the index, the less concentrated of a country's exports. This index values ranges between 0 and 1. Values closer to one indicate more concentrated trade structures. It is generally assumed that lower export concentration reduces the impact of international trade risks due to the possible price fluctuations of specific products. A country with few major trade partners might have a lower HI value.

Trade map provides on country or product performance, demand, alternative markets, performance of competitors and information on importing and exporting.

3. Result and discussion

As Table 1 and 2 indicates, RCA of wool and mohair sub-sector in Lesotho has shown a revealed comparative advantage during the study period 2003 to 2012. Lesotho is a net exporter of wool and mohair. Table 1 and 2 also indicates HI, the index of trade concentration or Hirschman index indicates that wool and mohair sub-sector shows lower concentration throughout the period of ten years from 2003 to 2012, lower concentration reduces the impact of international trade risk due to the possibility of price fluctuation of wool and mohair products. Export diversification is likely to be a proxy for a widening of comparative advantage that comes with a more diversified economy.

Table 1: Revealed comparative advantage of wool in Lesotho (RCA)

Year	World total export of all commo-dities (Million US$)	World total export of wool (5101) (Million US$)	Lesotho total export of all commo-dities (Million US$)	Lesotho wool (5101) export (Million US$)	Wool share in Lesotho export (%)	Wool share in the world trade (%)	RCA	Hirschman Index
	1	2	3	4	(4/3)	(2/1)	(4/3)/(2/1)	(4/3)sq.
2003	7586000	5000	221	2875620	1.30	0.07	19.74	0.026
2004	9081466	5300	714	3181214	0.45	0.06	7.63	0.009
2005	10359677	5100	650	3235230	0.51	0.05	10.27	0.010
2006	11983856	5200	689	5800537	0.84	0.04	19.40	0.017
2007	13827071	6000	770	7908540	1.03	0.04	23.67	0.021
2008	15970882	5600	883	5769092	0.65	0.04	18.63	0.013
2009	1238360	4000	723	9040902	1.25	0.03	38.71	0.025
2010	15075181	5600	801	12706802	1.59	0.04	42.70	0.032
2011	18013288	7800	1168	16728294	1.43	0.04	33.08	0.029
2012	18013778	6800	1099	19644514	1.79	0.04	47.35	0.036

Source: Author's calculations

Table 2: Revealed comparative advantage of mohair in Lesotho (RCA)

Year	World total export of all commo-dities (Million US$)	World total export of mohair (5102) (Million US$)	Lesotho total export of all commo-dities (Million US$)	Lesotho mohair (5102) export (Million US$)	Mohair share in Lesotho export (%)	Mohair share in the world trade (%)	RCA	Hirschman Index
	1	2	3	4	(4/3)	(2/1)	(4/3)/(2/1)	(4/3)sq.
2003	7586000	5000	221	618459.6	0.28	0.07	4.25	0.006
2004	9081466	5300	714	608506.8	0.09	0.06	1.46	0.002
2005	10359677	5100	650	1262497	0.19	0.05	3.95	0.004
2006	11983856	5200	689	1687681	0.24	0.04	5.65	0.005
2007	13827071	6000	770	1385753	0.18	0.04	4.15	0.004
2008	15970882	5600	883	1267546	0.14	0.04	4.09	0.003
2009	1238360	4000	723	1609281	0.22	0.03	6.89	0.004
2010	15075181	5600	801	2130903	0.27	0.04	7.16	0.005
2011	18013288	7800	1168	2785083	0.24	0.04	5.51	0.005
2012	18013778	6800	1099	2374134	0.22	0.04	5.72	0.004

Source: Author's calculations

Table 3 shows the result of ERP and NRP, the Balassa ERP of wool is -99.96 and ERP of mohair is -99. 52 in Lesotho. The negative ERP indicates that the weighted input tariffs on wool and mohair inputs amount is more than the output tariff, wool and mohair sub-sector is taxed by government tariff policies. The NRP is higher than ERP, which implies that tariff applied on the output is higher than the tariff on inputs.

Table 3: Effective and nominal rate Protection

	Balassa ERP	**NRP**
Wool	-99.96	12.67
Mohair	-99.52	64

Source: Author's calculation.

From Trade map analysis tool revealed that Lesotho has exported 6, 250 tons of wool and 790 tons of mohair to the world at an average value of US$ 2,607/unit and US$ 866/ unit respectively. The results further indicated exported value of wool and mohair in 2013 was 16,298 and 684 US$ US$ thousand respectively. This indicated the growth of wool product of Lesotho both in value and quantities.

China, South Africa and India are the leading importers of wool from Lesotho, accounting 47 percent, 31.4 percent and 21.7 percent share of Lesotho's export respectively. South Africa is the world first leading importer of wool from Lesotho in the period from 2009 to 2013 with 31.7 percent in growth in value. India has 8 percent growth in quantity from 2009-2013, the results also revealed that Lesotho is having high degree of concentration in terms of wool export to South Africa, China and India, therefore there is a need for Lesotho to diversify its markets.

4. Summary, conclusion and recommendation

The main objective of the study was to analyze trade structure and pattern of wool and mohair of Lesotho in order to better understand the structure and pattern of wool and mohair export in Lesotho. The study indicates that the RCA of wool and mohair sub-sector in Lesotho has shown a revealed comparative advantage from 2003 to 2012. The index of trade concentration indicates that wool and mohair sub-sector shows lower concentration throughout ten years. The results of ERP and NRP are negative; this indicates that the weighted input tariffs on wool and mohair inputs amount more than the output tariff. This indicates that wool and mohair sub-sector is not protected but it is taxed. The tariff schedule structure may have a substantial impact on efficiency. A very dispersed and cumbersome tariff structure on inputs and outputs may mean that protection remains uneven, and gains from openness may still be inadequate. Thus, the tariffs structure of the input sector for wool and mohair sub-sector should be looked into. Lesotho is having high degree of concentration in terms of wool export to South Africa, China and India, while mohair is highly concentrated in South Africa only.

It is recommended that Lesotho should diversify geographic destination of its trade and should have the capacity to process the greasy wool and mohair into a high quality raw material required by the textile industry in the world markets, this can be achieved through the establishment of a scouring plant where value can added to wool and mohair before exported directly to the international markets. This will help farmers to relate directly with the international markets for their products rather than to sell their wool and mohair in auctions where these commodities will be re-exported and this will help to avoid double taxation of the sub-sector

5. References

Bahta, Y.T., Willemse, B. J. and Grove, B. (2013). *The comparative advantage of South Africa Soybean production*. Department of Agricultural Economics. University of Free State. South Africa.

Balassa, B. (1965). Trade Liberalization and Revealed Comparative Advantage. *The Manchester School of Economics and Social Studies*, 33(99): 99-125.

BKB Fibretrack (2013). Wool and Mohair Marketing Reporting Service: *Lesotho Wool and Mohair* 2012/2013. South Africa.

Central bank of Lesotho (2014). *Fiscal policy sustainability in Lesotho*. Annual report. Maseru. Lesotho.

Chen, X. and Godager, G. (2011). *Development of competition indicators in the Norwegian general practice*. Department of health management and health economics. University of OSLO.

Department of Livestock Services (2013). *Lesotho wool and mohair production* annual report. Maseru. Lesotho.

Diakantoni, A. and Escalth, H. (2012). Reassessing Effective protection Rates in trade in tasks perspective: *Evolution of trade policy in factory Asia*. World Trade organization. Geneva. Switzerland.

IFAD (2014). *Kingdom of Lesotho: Wool and Mohair Promotion Project*. Programme Management Department. East and Southern African Division.

International Trade Centre (2014). Trade Statistics for international Business Development. Monthly, Quarterly and yearly trade data. Import and export values, growth rates and market shares. Available from: www.trademap.org. (Accessed on the 24 October 2014).

Leishman, D., Menkhaus, D. J. and Whipple, D.G. (2013). Revealed Comparative Advantage and the measurement of international competitiveness for agricultural commodities: An Empirical Analysis of Wool Exporters. Fargo ND. Western Agricultural Economics Association.

Lesotho Bureau of Statistics (2014). *Lesotho Livestock Statistical Report*. 2013/2014. Kingdom of Lesotho.

Ministry of Agriculture and Food Security (2014). *Annual report*. Maseru. Lesotho.

Ministry of Trade Industry Cooperatives and Marketing (2014). *Quarterly report*. Maseru. Lesotho.

Rakoto, L. D. (2011). Trade liberalization in Southern Africa with particular reference to Lesotho and SACU's regional trade agenda. Stellenbosch: Tralac.

Rath, T., Risopoulos, J., Twomlow, S., Rota, A., Mazzoli, E., Creswell, R., Baumgartner, P. and Anyonge, T. (2014). *The kingdom of Lesotho. Wool and mohair promotion project.* Maseru Lesotho.

Reed, R. M. (2001). *International trade in agricultural products*. Prentice-Hall. United States of America.

Tragurtha (Undated). *Enhancing the structure and Performance of Value Chains*: A Case Study of the Lesotho Wool and Mohair Sector. Commark Trust.

UN COMTRADE (2014). *International Trade Statistics, Trade by Commodities*. Department of Economics and Social Affairs, United Nation.

USAID (2008). Development of the effective Rate of Protection Model for Ghana. America.