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Trends of Mushrooms Trade in Ethiopia

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ABSTRACT

Information's on the trends of mushrooms trade in Ethiopia using long-term data is lacking, and such analysis are important for marketing, and policy formulation purposes. The objectives of this study paper are 1) to evaluate the trends of mushrooms export and import in Ethiopia 2) to categorize the countries of origin for the imported mushrooms and destination countries for the exported mushrooms 3) to analyse the trade balance. To achieve the objectives long term data of the imported and exported mushrooms, in the years of 1997-2016, were used. Descriptive and inferential statistics were used to analyse the data. The results indicated that, the country imported and exported an average of 10.8 tonnes and 68.3 tonnes of mushrooms per year, correspondingly. Similarly, the country spent an average of US$ 134383.9 per year for the imported mushrooms while it earned an average of US$ 23530.9 per year from the exported mushrooms, which shows that a trade deficit to mushrooms. The result further indicated that on average the quantities of mushrooms imported to the country and the expenditure to import increased yearly by 62.6% and 53.2%, correspondingly. Therefore, it is recommended that the country has to give due attention on the expansion of commercial mushrooms to reduce the import, to be self-sustained and to generate foreign incomes from its export.

Keywords: Expenditure, Export, Import, Income, Mushrooms

INTRODUCTION

A mushroom, or toadstool is the fleshy, spore-bearing fruiting body of a fungus, typically produced above ground on soil or on its food source, which can be hypogenous or epigeous, large enough to be seen with the naked eye and to be picked by hand. Mushrooms lack true roots and they anchored into the substrates, this is affected by their tightly interwoven thread-like hyphae, which also colonise

the substrates, degrade their biochemical components, and siphon away the hydrolysed organic compounds for their own nutrition. There are both edible/medicinal and poisonous species of Mushrooms. It has been estimated that over 70,000 species of fungi are found and of which about 2000 species that belong to 31 genera are regarded as prime edible mushrooms. Around the world about 60 mushroom species have been cultivated commercially. The most common types of edible mushrooms are: Oyster, Common and Shiitake. These three types of mushrooms make up about 70% of the world's production. Wild edible fungi are collected for food and to earn money in more than 80 countries. The number of poisonous mushrooms is relatively small whereby only about 10% that belong to 30 species are lethal. There is undoubtedly high diversity of wild mushroom in the world and in Africa. Eating mushroom can prevent various vitamin B and D deficiencies including beri-beri (thiamine), nerve tissue damage (riboflavin); abnormal growth in infants and children (niacin); and rickets (vitamin D). Vitamin D, from mushrooms could boost calcium absorption and thus plays an important role in bone formation [1]. Furthermore, their value has recently been promoted to tremendous levels with medicinal mushroom trials conducted for HIV/AIDS patients in Africa, which have been generating encouraging results.

Nearly 42% of the world mushroom production takes place in China, 12 % in the USA, and 8% in the Netherlands. China is the largest producer, consumer and exporter of mushrooms in the world followed by USA and Netherlands. China grows more than 60 mushroom species in a small to commercial scale. The world production of mushroom in China in 2010 was 21,524,473 tonnes of which, unlike other countries of the world, the major share goes to oyster mushroom. Oyster mushroom (Pleurotus ostreatus) is the third mushroom of the world produced by China with a production of 4,929,000 tonnes. World canned-mushroom exports were an estimated 458,137 metric tonnes in 2008, and China had 87 percent of the total. Global exports of fresh mushrooms amounted to 34,802 metric tonnes in 2008, with Canada and the United States accounting for the bulk of the total in 2008. Generally, mushroom with their great variety of species, constitute a cost effective means of both supplementing the nutrition to human kinds and can generate additional employment and income through local, regional and national trade offering opportunities through processing enterprises. Trade in cultivated mushrooms can provide a readily available and important source of cash income for men, women, young, the old, infirm and disabled. Mushroom cultivation activities can play an important role in supporting the local economy by contributing to subsistence food security and generating additional employment and income through local, regional and national trade and offering opportunities for processing enterprises.

In Ethiopia, wild mushroom has been abundant and the consumption habit of mushrooms by local people common. However, the practice of mushroom cultivation in the country is very poor, and if present, it is mostly restricted to urban areas. Currently, in the capital city (Addis Ababa), fresh mushrooms are sold in supermarkets, cafeterias and hotels. In Ethiopia, the production and consumption system of mushrooms is low; even though large hotels and foreigners used from supermarkets which is imported from abroad, as a result production of mushroom in Addis Ababa cannot support the consumers in the city. In order to fulfil the demand of mushrooms the country is

importing it from different countries. So far, published works that shows the trend of import and export of mushrooms in the country are lacking. Therefore, the objectives of this study paper are 1) to evaluate the quantities of imported and exported mushrooms in Ethiopia 2) to assess the trend of expenditure to import and incomes generated from the export of mushrooms 3) to identify major suppliers of mushrooms to Ethiopia and also to classify the major destination countries for the exported mushrooms 4) to draw recommendations for policy formulation purposes.

METHODS AND MATERIALS

The study based on raw data the international trade of import - export of mushrooms, in the periods of 1997–2016, were collected from the Ethiopian Customs and Revenues Authority (ECRA). The data was used import-export information of mushroom and then carefully segregated. For the imported mushrooms, cost, insurance, and freight (CIF) values; while for the exported mushrooms, free on board (FOB) values were used in the analysis. The CIF and FOB values, which were in local currency (Birr), converted into US$, based on the exchange rate data obtained from the National Bank of Ethiopia for the different months and years' time of the study period.

The trend of change (%) on the expenses for the imported mushrooms was calculated using the formula: Trend of change = (Expenses to import the mushroom in the later year − Expenses to import the mushroom in the earlier year period)/Expenses to import mushroom in the earlier year) * 100. The trend of expenses in the years of 1997–2016 was computed using Excel sheet (Microsoft Corp., Redmond, WA, USA). The trade balance was calculated by subtracting the imported quantities/expenditures to import from the exported quantities/incomes generated in the same years' time period. Overall, for the data analysis descriptive statistical methods, including graphs and percentages were used. Excel sheet and SigmaPlot 13 program was used to analyse the data (Tables 1-4 and Figures 1-2).

RESULTS AND DISCUSSION

Trends of mushrooms import and export

Table 1: Descriptive summary of variables used in production and cost functions of wheat (N=123).

Variables	Unit	Min	Max	Mean	Std. Dev
Land	Ha	0.125	2	0.52	0.372203
Yield	Qt.	0.25	52	10.05	8.84937
Seed	Kg	12.5	200	53.75	33.5558
NPS	Kg	0.0001	300	61.03	41.24759
Urea	Kg	0	300	74.39	64.78026
Labour	Man-days	4	101	30.02	15.226
Oxen	Oxen-days	6	44	16.94	6.6891

Total cost of production	Birr	909.5	12230	3950.7	1828.485
cost of seed	Birr	250	3000	798.28	504.1127
cost of NPS	Birr	0	3600	742.857	509.0636
Cost	Birr	112	3600	775.5907	706.7171
Cost of labor	Birr	80	3800	955.305	697.1267
Cost of oxen	Birr	90	2050	591.11	265.694
Cost of land	Birr	7.8	480	87.65752	77.01

Table 2: Socioeconomic characteristics of sampled households.

Variables	**Min**	**Max**	**Mean**	**Std. Dev**
Age of household head in (years)	21	70	44.76	12.41
Family size in (ME)	1.2	12.6	4.92	2.05
Education level of household head in (years of schooling)	0	13	5.72	3.92
Farming experience of household head in (years)	1	50	22.62	11.55
Total land owned in household head in (ha)	0.25	3	0.93	0.56
Land fragmentation of household in (number)	0	7	2.22	1.16
Livestock owned in (TLU)	0	19	7.03	3.53

Table 3: Summary of dummy variables in used in the model.

Variables	**Description**	**Frequency**	**Percentage**
Gender of household head	Male(0)	109	88.6
	Female	14	11.4
Access to extension service	Yes (1)	104	84.6
	No	19	15.4
Participation in off/non-farm activities	Yes (1)	31	25.2
	No	92	74.8
Credit utilization	Yes (1)	56	54.5
	No	67	45.5
Perception to fertility status of soil	Yes (fertile) (1)	109	88.6
	No (infertile)	14	11.4

Table 4: Summary of level of efficiencies in sample households.

Efficiencies	Min	Max	Mean	Std. Dev
TE	0.06	0.88	0.5563	0.19008
AE	0.06	0.97	0.5547	0.21017
EE	0.01	0.61	0.3085	0.14561

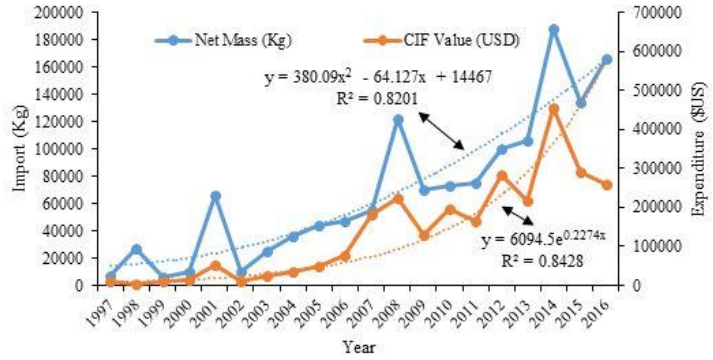

Figure 1: Trends of mushrooms imported and expenditure in Ethiopia.

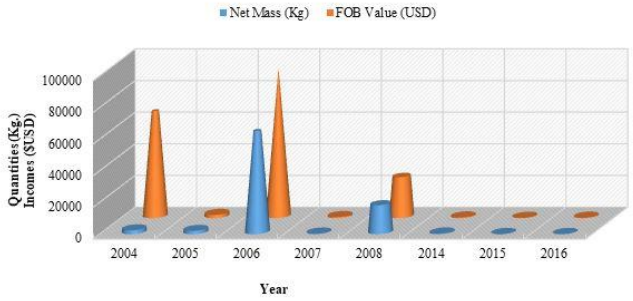

Figure 2: Trends of mushrooms exported and income generated in Ethiopia.

The results on the different quantities of mushrooms imported and also exported to Ethiopia between the years of 1997-2016, are presented. It is indicated that in these years' time period, the country imported a total of 1366.7 tonnes of mushrooms which means an average of 68.3 tonnes /year. The result on the quantities of mushrooms exported from Ethiopia and also incomes generated in the years of 1997–2016 is presented in (Figure 2). Accordingly, it is indicated that in the study years' time, the country has exported a total of 86.9 tonnes of mushrooms, which means a yearly average of 10.8 tonnes of mushrooms [2]. This result could show that the quantity of mushrooms imported to Ethiopia is greater than the exported one, by 6.3%. This indicated that the country is heavily dependent on the imported mushrooms and is not self-dependent. According to the market survey conducted in 2006/07 in Addis Ababa, supply of fresh mushrooms is close to zero (demand of fresh mushroom exceeds the supply). As a result the existing few fresh mushroom producers in Addis Ababa could not meet the demand of the market. Because of this, certain supermarkets

in Addis Ababa import chemically preserved mushrooms at higher costs and sell at higher prices that would be complemented on the ultimate consumers. The result further showed that Ethiopia started exporting mushrooms in 2004. Though the reasons behind was not clear, Ethiopia did not exported any mushrooms in the years of 2009-2014. The highest quantities of mushrooms exported from Ethiopia and incomes generated from the export were in the year 2006. In their studies indicated that there were mushroom producers in Ethiopia. They identified the challenges that for the commercial mushroom producers; lack of capital investment to start up, flying pests, diseases, high temperatures, lack of physical materials such as the production place, lack of training and experience, lack of awareness of the people due to lack of modern advertisement, lack of support from governments and other bodies as well as less concern of the government about the practice of mushroom farming makes them less productive. Showed in his study large investments are needed to establish a modern mushroom farm, which requires not only state-of-the-art technology but also high-quality compost, improved cultivation, and the whole cooling chain.

The results on the expenses to import the different quantities of mushrooms to the country are presented. The analysed result indicated that in the study period of years in total the country spent US$ 2687677.2 to import different quantities of mushrooms from different countries. This could indicate that the average yearly expenditure of the country to import mushrooms was US$ 134383.9. The results on the incomes generated from the export of mushrooms in different years' time are presented. Accordingly, in the study periods of time the total income the country generated from the export of mushrooms was US$ 188247.3 in total which means an average yearly income of US$ 23530.9 per year. The trade balance result indicated that the expenditure to import the mush rooms in Ethiopia is much higher than the incomes generated from the export, which shows that there was a negative trade balance. In general the incomes generated from the export of mush rooms was much less than the expenditure to import by 5.7%. This could show that the country has to give due attention to reduce the expenditure form the import by expanding commercial farms of mushrooms in the country which also could be important to diversify livelihoods and income generating activities. In his study revealed that even the existing market demand and supply of mushrooms in the local market were at rudimentary stage and the specific factors contributed to this condition were termed to be inefficient production and poor quality of the products and amount of production, most of the production is practiced at small scale level [3]. Their study results found that on average within 45 days (one production period) a producer of a mushroom gains up to 3300 Birr and up to 26,400 Birr per annum; and there is a possibility to cultivate mushrooms in Ethiopia 8 times in a year. This could show that a mushroom cultivation is productive and profitable if it could be produced intensively followed by modern farming.

The trend analysis result for the relative quantities of imported mushrooms and the relative expenditures to import the mushrooms is presented in Figure 3. The analysis result indicated that on average the quantities of imported mushrooms to the country in the study periods of time (1997 – 2016) increased on average and yearly 62.6%. Similarly, the analysis on the trend of expenditure to import the mushrooms in the study period of time is presented in Figure 3. The result indicated that

the average yearly expenditure to import mushrooms from different countries was increased on average and yearly by 53.2%. Figure 4 shows the trade balance result on the exported and imported quantities of mushrooms (Kg.) and also on the incomes generated from the export and expenditures to import (US$) in the study periods of time. The findings indicated that for most of the years the imported quantity of mushrooms was higher than the exported quantities of mushrooms which show a trade deficit of the mushroom. Similarly, there is trade deficit on the incomes generated from the export of mushrooms as in most of the years the expenditure to import mushrooms was much higher than the income of the export (Figure 4). Overall, the trade balance result showed that on average the quantities of mushrooms exported from Ethiopia was much less than from the import of mushrooms on average and yearly by 63987.6 Kg. Similarly, the incomes generated from the export of mushrooms from Ethiopia were much less than the expenditure to import the mushrooms yearly on an average of US$ 124971.5. Study results there is a huge trade deficit on mushroom and increasingly demanding high-quality products (Figures 3 and 4).

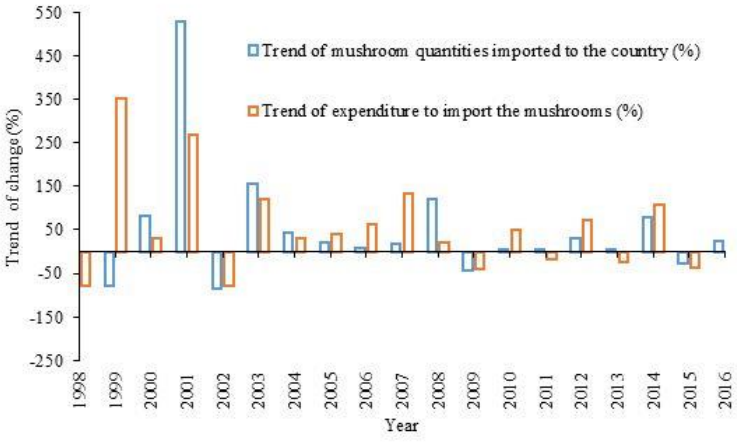

Figure 3: Trend of percentage change on the quantities and relative expenditure of mushroom in Ethiopia.

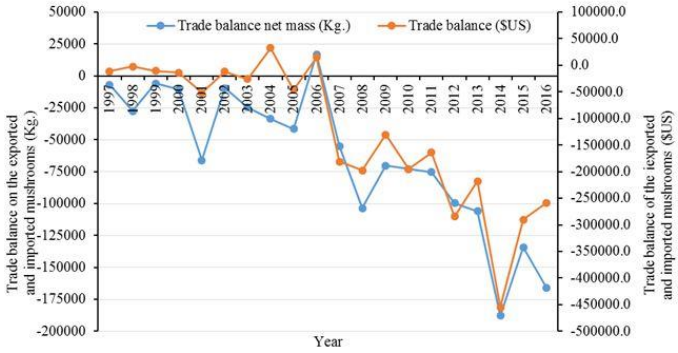

Figure 4: Trade balance of mushroom in Ethiopia.

Major countries of origin for the import and destinations for the export of mushrooms

Results indicated that between the years of 1997-2016, Ethiopia has imported mushrooms from twenty nine countries. Similarly, the country has exported mushrooms to a total of twelve countries in the same study period. This t could show that Ethiopia involved within a few countries for the export of mushrooms. The major countries that are supplying mushrooms to Ethiopia and also the relative expenditure to import the mushrooms from the different countries in the study period of time is presented in Figure 5. About 47%, 30%, 13%, 4%, 3%, 1% and1% of the imported mushrooms were supplied from United Arab Emirates (UAE), Netherlands, Italy, Belgium, Djibouti, Malaysia, and Somalia, respectively. The result indicates that European countries are the major suppliers of mushrooms while mushroom import with African countries was limited only to Djibouti and Somali. The results further showed that Malaysia supplied about 1% of the total mushrooms to Ethiopia in the study period of time while the expenditure to import was about 26% [4]. This could indicate that the importing mushroom in Malaysia was very expensive as compared to other countries (Figure 5).

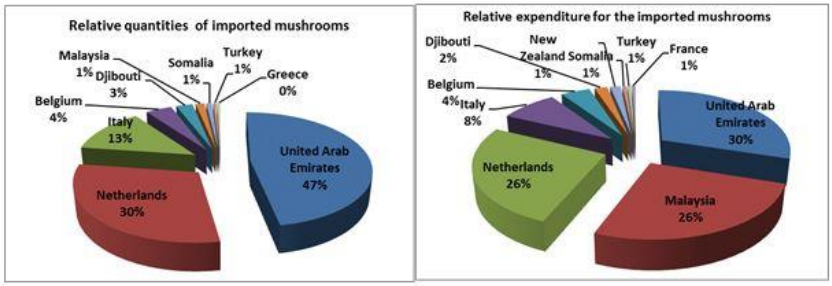

Figure 5: Major countries importing mushrooms to Ethiopia and its relative expenditures.

The major destination countries for the exported mushrooms and also the relative income generated from the export from different countries of destinations in the study period of time (1997–2016) is presented in Figure 6. Overall, in the study periods of time the country has exported mushrooms to a total of 12 countries. About 85.7%, 2.5%, 2%, 2%, 2%, 1.8%, 1.6%, 1.6% of mush rooms produced from Ethiopia were exported to Yemen, Italy, Sudan, Djibouti, United Arab Emirates, Netherlands and United Kingdom, respectively (Figure 6). Similarly, about 64.4%, 1%, 0.9%, 0.4%, and 28% of the incomes from the export of mushrooms were gained from Yemen, Saudi Arabia, Italy, Sudan, and United Kingdom, correspondingly. This result could show that Yemen was the major destination country for the exported mushrooms of Ethiopia. Though the exported quantities of mushrooms to United Kingdom was about 2%, the result further showed that the income generated from the two percent export to United Kingdom was much higher than other similar countries where equal amount of mushroom is supplied. This could show that, exporting mushrooms produced from Ethiopia to the United Kingdom is much more profitable than exporting it to other countries [5].

CONCLUSION AND RECOMMENDATION

Despite the fact that Ethiopia has favourable climatic conditions for the production of mushrooms the findings indicated that the country is heavily dependent on imported and preserved mushrooms. Therefore, it is recommended that 1) Attention has to be given for the expansion of commercial mushroom producing companies in Ethiopia who could fulfil the local market and generate incomes through exporting 2) the country has given due attention for job creation to the youths, and therefore, mushroom production could be considered one important area for the employment of the youths 3) policy makers and agriculturalists has to give emphasis to incorporate mushroom production in the agricultural and forest development strategy of the country.

CONFLICTS OF INTEREST

The authors declare they have no conflicts of interest.

AUTHORS' CONTRIBUTION

Shiferaw Alem is the principal author, with significant contributions by the one co-authors.

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