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## ECONOMIC IMPACT OF EPIZOOTIC LYMPHANGITIS ON LIVELIHOOD OF HORSE DRAWN TAXI OWNERS IN BISHOFTU CITY, ETHIOPIA

**Dr. Bisrat Tekle, (Senior Social Researcher & Assistant Professor, Center for Research in Ethics & Integrity, Ethiopia Civil Service University, Ethiopia Email:bisrat.tekle@gmail.com)**

**Dr. C. Senthil Kumar, Assistant Professor, Dept. of Sociology and Social Work, CSSH, Arsi University, Ethiopia.**

**Mr. Gebre Tefera Engida, (MSW, Community Training Coordinator, Addis Ababa University, CVMA, Society for Protection of Animals Abroad-SPANNA, Ethiopia Email:gebre.tefera@aau.edu.et)**

### ABSTRACT

*Epizootic Lymphangitis (EZL) is reported to have a significant impact upon livelihood within the resource poor settings. This study used quantitative to describe the direct financial and other indirect impact of EZL and examined the perceived impact of disease and owners perception towards financial lose due to the disease. Structured questionnaire were administered to 96 owners at the parking station out of which 90 respondents fill and gave the answer back. The major impact of EZL on the income due to EZL has been addressed. Data were analysed using descriptive statistics (SPSS) Results are presented using tables and graphs. Lose due to EZL is well acknowledged by the owners all over the town and seek the solution to tackle the spread of the disease. The impact of EZL was multi-dimensional and encompassed effect upon the horse, the individual owners and the wider society. Working equid provide a vital utility and source of income to many people in resource-poor-settings. Often infection with EZL resulted in reduction in working ability and death of horse which had direct a direct impact upon the livelihood of owners and their dependents family members.*

*Key words; Epizootic Lymphangitis, carthorses, Livelihood*

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## Introduction

On the FAO report on 2014, shows that there was a growing recognition and collection of evidence that working animals play a significant role in supporting the livelihoods of the families who own them and in fulfilling socio-economic functions that benefit animal owning households and the wider community. In particular, their contribution to income-generating activities has recently attracted attention and interest – they are often the major or a key source of income for families. It is well acknowledged that working animals contribute to households' livelihoods including: by providing public taxi transport service, transporting water, construction materials and other daily domestic needs to the homestead, in particular relieving the physical burden of women and freeing their time for other household such as proper children rearing in rural communities or income-generating activities, Transporting water and fodder for other livestock, ambulatory service for sick other animals, Providing draught power for agricultural tillage, including ploughing, harrowing and weeding, taking agricultural and livestock products, such as milk, vegetables, cash crops and other farm produce, to the market and bringing market purchases back to the homestead.

FAO also reported that working equids used for small-scale commercial activities such as taxi services, carting goods or petty trading, being rented out to provide an income for the animal owner and a small business opportunity for the hirer particularly in construction activities. Transporting commercial output, such as coffee, from farm to road-head or transport hub, collect harvested crops to home area and transporting agricultural inputs and other geographically localised goods such as salt over long distances from salt pans or coastal area to the cities.

These working animals also play significant role in strengthening social relationships within extended families and communities through lending at times of need, for example during ploughing and harvesting seasons, providing manure for fertilizer and income providing a source of bride wealth, forming an important part of weddings or ceremonial occasions particularly in the case of Rural Ethiopia.

## Overview of the Horse Disease-Epizootic Lymphangitis

Many diseases affect the power generating ability of carthorses. *Histolosma c. var farciminosum* (HF) (Selim *et al.*, 1985; Weeks *et al.*, 1985) known widely as Epizootic

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Lymphangitis (EZL) is a chronic contagious, afebrile, fungal infection of equids characterized particularly by granuloma, suppurating ulcers of the lymphatic vessels and skin with possible extension to the associated lymph nodes. Infection may also lead to pneumonia and conjunctivitis. It is caused by *Histoplasma capsulatum* variety *farciminosum* (HCF) which until recently was known as *Histoplasma farciminosum*. This diseases cause painful skin and eye lesions travelling through the lymphatic vessels, causing swelling of the limbs and nodules elsewhere in the body, and then lead to lameness and loss of use in working horses, donkeys and rarely mules throughout the developing countries. Quite often horses become out of use and abandoned or euthanized at the final stage of the disease. Abandoned horses usually seen by the side of the road. The assumption is that they want to stand where less flies are likely because of air currents from the passing vehicles. These abandoned horses will become source of the disease spread to other horses, public health risk and traffic accident.

### **Statement of the Problem**

Although the disease seems economically and socially very important, there is a shortage of information and only few researches conducted on the impacts of the disease on the income and overall livelihood of carhorse taxi owning community. This study was, therefore, to show the current direct economic impact of EZL on the livelihood of carhorse taxi service providing people and problem on the beneficiary community in Bishoftu City.

According to Brooke International report working equine animals play diverse social and economic roles in helping to maintain and enhance all categories of capital (human capital, natural capital, physical capital, financial capital and social capital) assets contributing to a sustainable livelihood. (Brooke, 2015).

Horse drawn cart business has long been used as a source of income for significant proportion of urban population of the country. In Bishoftu City there are so many community members leading their life based on the income they generated from providing carbon free and environmentally friendly horse drawn taxi service. This part of the community is benefiting from this activity through the income they earn including household consumption, school fee for their children and in succeeding other social interaction. And this business also play a significant role in minimizing high unemployment rate in the City.

Despite the fact that working animals are key source of income and play important role in food security, there was no much information about factors threatening (Epizootic Lymphangitis) livelihood and of community members depending on the life of these animals.

On the study conducted on the epidemiology of this disease there was a big desire of owners to find out the solution for the disease, the disease also ranked high among working equine owners as a major problem during prioritisation. The report mentioned that many owners acknowledged the disease had the direct economic impact on daily income due to its chronic and debilitating effect. They will continue to work with the horse as long as possible but ultimately they became so affected and can no longer work (Nigatu and Abebaw, 2010).

To this end, to achieve the objectives of the study, the following basic research questions were stated:

- What are the economic impact of the Epizootic Lymphangitis on the livelihood of cart business owning community?
- What are the social impact of Epizootic Lymphangitis on the horse owning community?
- What are the public health impact of Epizootic Lymphangitis on the urban community?

## **Objectives of the study**

### **The General Objective**

The general objective of this study was to explore micro-level economic impact of Epizootic Lymphangitis (EZL) the horse disease on the livelihood of horse drawn taxi owning community in Bishoftu City.

### **Specific objectives**

The following were the specific objectives of the study:

- To identify the economic impact of the Epizootic Lymphangitis on the livelihood of cart business owning community

- ✚ To assess the social impact of Epizootic Lymphangitis on the horse owning community
- ✚ To findout the public health impact of Epizootic Lymphangitis on the urban community.

### **Significance of the Study**

There was an annual clinical case report from Addis Ababa University, Society for the Protection of Animals Abroad (SPANNA) Ethiopia project on EZL show that 213 carthorses from Bishoftu City and surrounding towns infected with EZL and admitted for treatment in 2017, however only 9% of cases reported cured of the disease in Bishoftu. About 91% of the carthorses either euthanized to control the spread or died somewhere else in the field.

To this end, identifying these issues has much more importance to clearly understand, plan, develop and carry out appropriate strategies to bring about a difference in the livelihood of the victims and the society at large. More importantly, the study benefits the transport office experts, veterinary medicine (public health) experts and policy makers in creating awareness about the multi aspect effects of the disease. Finally, the study will serve as steppingstone for academicians, researchers and practitioners where it enables them to start looking into the course and impacts of EZL on the livelihood of horse drawn taxi owning community in particular and the society in general.

### **Scope of the study**

This study was conducted in Bishoftu City where Epizootic Lymphagitis is more prevalent in this area because of comfortable climate for the incubation of the fungus, and threatening the life of people owning horses. Losses were estimated from reduced working hours per day, treatment cost, absence from work, and death of EZL affected horses and indirectly replacement of lost horse due to EZL. Bishoftu City located 47km east of capital city Addis Ababa on the main road from Addis Ababa to Djibouti. It is a mid-land with the topography of hot and humid weather condition. It has an annual rainfall ranging from 150-650mm. Cart taxi owners in this City are not restricted to proving transportation service to people, they are also transporting agricultural products and inputs to and from market place and distribute to each nearby villages.

## **Review of the Related Literatures**

### **Role of Working Equines in Transportation**

Working equines are important animals in the transport systems of Ethiopia. Recent report show that Ethiopia has 9 million equines out of these horses are estimate to be 2.7 million which are used for transportation of people and goods (63.7%), draught purpose (8.0%) and 18.3% for other uses. Horses are financial assets-they can be sold, generate direct income for the family through hiring and using. These animals are also physical capitals for the community-cart and pack use to transport goods and people (at household and national level), enabling physical access to places, key element of agriculture and other industries' value chain (The Brooke, 2015; FAO, 2014).

### **Impacts of the disease on the livelihood**

Horse drawn cart business has long been used as a source of income for significant proportion of urban and rural population of the country. However, huge number of horses are prone to different diseases particularly a highly contagious disease called Epizootic Lymphangitis which has significant economic importance in Bishoftu because of its high prevalence (Nigatu and Abebaw , 2010). This study revealed that carthorses are affected by many life threatening diseases; of which the major one is Epizootic Lymphangitis (Nigatu and Abebaw, 2010). In the other study undertaken in 28 towns of Ethiopia, Epizootic Lymphangitis is reported to occur with average prevalence of 18.8 %. This study indicated that Bishoftu City was the place where Epizootic Lymphangitis was more prevalent and leads to death and abandoning, because of its geographical location.

Epizootic lymphangitis (EL) is a debilitating contagious disease of working equids, caused by the dimorphic fungus *Histoplasma capsulatum* var. *farciminosum*, which is transmitted through contact of infected material with traumatized skin, by biting flies and ticks, or inhalation of spores. The disease occurs clinically as cutaneous, ocular, respiratory, or mixed clinical forms, and the cutaneous form is the most common. EL is currently endemic in the regions of Sub-Saharan Africa. The disease is highly prevalent in Ethiopia; depending on the region, the prevalence of EL in cart animals varies from 0 to 44% (Bekele et al, 2014 ). The high prevalence of EL in Ethiopia poses a great threat to the cart business . The use of horse or mule drawn carts to generate income is a means of survival for a significant number

of Ethiopian households and provides an affordable transportation service in many towns. EL causes significant damage to the incomes of cart animal owners due to lesser pulling/loading capacity of the diseased animals, unwillingness of customers to use carts pulled by infected animals, treatment costs, and absence from work and death of affected cart animals. EL is also a serious animal welfare problem. Due to chronic nature of the disease and unavailability of effective treatment, affected horses and mules are often made to work until they are severely debilitated by the disease and unable to work and generate income. Finally, at advanced stage of the disease, they are abandoned and die with their welfare gravely compromised. Generally, the impact of EL is multi-dimensional and encompasses effects upon the cart animal, the livelihoods of individual owner or driver, and the wider society (Radostits, 2007).

### **Economic impact of Epizootic Lymphangitis**

Epizootic lymphangitis is one of the infectious diseases causing huge economic losses and low productivity in horses (Ameni , Terefe and Hailu, 2006). It is an economically important disease in some areas of the world, particularly where large numbers of horses, donkeys, or mules are assembled. This disease was a serious concern during the early twentieth century when large numbers of horses were stabled together (www.qldhorsecouncil.com). This disease continues to be a significant concern in some countries such as Ethiopia, where the prevalence in carthorses is nearly 19% and economic losses from this disease are high (Seid, Fedlu and Mama, 2019). The impact of EPL was multi-dimensional and encompassed effects upon the horse, the individual owner and the wider society. Working equids provide a vital utility and source of income to many people in resource-poor settings. Often, infection with EPL resulted in a reduction in working ability which had a direct impact upon the livelihoods of owners and their dependent family members. EPL also impacted upon the welfare of the horse as sick animals continued to be worked and, in advanced cases, horses were abandoned due to ineffective or unavailable treatment (Scantlebury et al., 2015). Treatment costs in terms of money and time lost by owners without effective treatment outcomes contribute to the suffering and death of animals. In Ethiopia equines are important animals to the resource-poor communities in rural and urban areas of Ethiopia, providing traction power and transport services at low cost. The use of equines in door-to-door transport service also provides urban dwellers with

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the opportunity of income (Scantlebury et al., 2015). In general, the study has shown that EPL greatly affects the economic and social wellbeing of equine owners. Direct effects include reduced income due to lower work capacity or inability to work at all, cost of treatment, loss of customers and the need to purchase new equines. In addition, the owner faces social stigma due to foul smelling.

### **Status of Epizootic Lymphangitis in Ethiopia**

Although Epizootic lymphangitis has been eradicated from Europe, it is currently prevalent in Ethiopia, where between 0% and 39% of equids may be infected, with the rate being dependent upon the region (Asfaw , Ameni and Mahindra , 2012). In two separate participatory studies in different areas of Ethiopia, horse owners consistently volunteered EPL as a high-priority disease (Scantlebury et al., 2015). EPL contributes to extensive morbidity and subsequent mortality due to abandonment of chronically infected animals and can have a devastating impact on the incomes of poor families (Jones, 2006 ). Within regions where the disease is endemic, access to treatment is a significant challenge. The Society for the Protection of Animals Abroad (SPANNA) currently provides free veterinary care within its clinics; however, topical treatment with tincture of iodine and oral dosing with potassium iodides are labor intensive, expensive, and of limited efficacy in moderate to severe cases of EPL. It is imperative that animals be diagnosed early during the disease to improve treatment outcomes, conserve resources, and reduce the burden of infection within the population. Currently, due to limited available diagnostic technologies, veterinarians in Ethiopia diagnose the disease based on clinical appearance and microscopic examination for yeast cells within pus.

## **Methods and Materials**

### **Research Design**

Qualitative and quantitative research method was employed to conduct this study

### **Population, Sample Size and Sampling Techniques**

Based on the data from Cart horse owners Association in the City and data from city Administration, the number of registered people owning cart-horse taxi and providing transport service all over the City currently are 960 in Bishoftu City. These people have



their own cart plate number. So that these numbers were used to randomly select the participant

## **Source of Data**

The primary data used in this research were collected directly from horse owning community and Animal health professionals, and the secondary data was collected from reports in College Vet Medicine and Agriculture AAU, and online material.

## **Instrument of Data Collection**

Semi-structured questionnaires were developed and directly read to all owners and the response was recorded on the space provided. Direct observation of horses infected with the disease also used as data collection method.

## **Method of Data Analysis**

Descriptive data analysis method was used to analyse the information collected from the owners. The researcher used this method to describe the multi dimensional challenges faced and different impacts on the working animal owners in the town.

There are some owners providing service with any legal registration and they were not included in the population size of this study. So that this documented registration list was the only tangible reliable source of data in the City and these people are member of the association who are currently providing the service and can be used as a target population for the purpose of this study. The population size in this study does not indicate the number of horses but the population size was the number of horse owning community members, the number of horses owned by this population might be doubled. 96 horse drawn cart owning people were selected based on systematic sampling using their cart plate numbers and questionnaire were distributed to every seventh cart owner at cart taxi parking station and the surveyors were expected to read the questions for those who couldn't read at all. 96 structured questionnaire survey were administered to the respondents (cart horse owners) living in Bishoftu City. Out of these respondents six were fail to reply so that only 90 respondents were willing to fill reply to the distributed questionnaire. Data analysis was made using descriptive statistics with SPSS version 20, and reported using graphs and tables.

## Limitation of the study

Even though more number of carts working in the town they were not included in this study. Because they might either migrate to the town for short period of time or working between urban and rural without residing in the town.

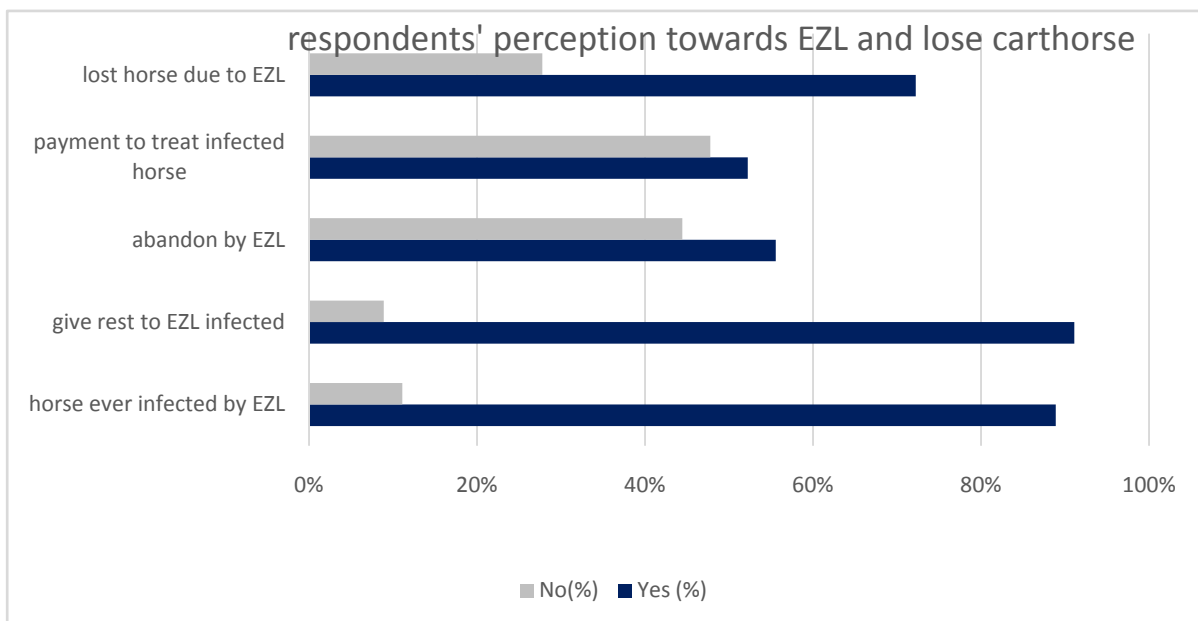
## Result and Discussion

The study revealed that an owner will lose ETB88.00 per day because the horse infected with EZL cannot perform as the horse free of the disease. There are also indirect loses due to the feeding cost of sick horse. However 48.9% of the owner get their horses treated free of charge at a UK based animal welfare charity organization called SPANA (Society for the Protection of Animals Abroad), treatment fee has no significant effect on the income. 72.2% of the respondent of this survey have lost one of their horse due to EZL since they start the business, which means they have lost at least ETB 6000.00per horse at a time.

This business is dominantly owned by male (88.89%) group like other transport service providing units such as motorised transport services

Table1: Whether the Horse was lost due to EZL or other problem in business life

		Frequency	Percent(%)
	No	25	27.8
	Yes	65	72.2
	Total	90	100.0

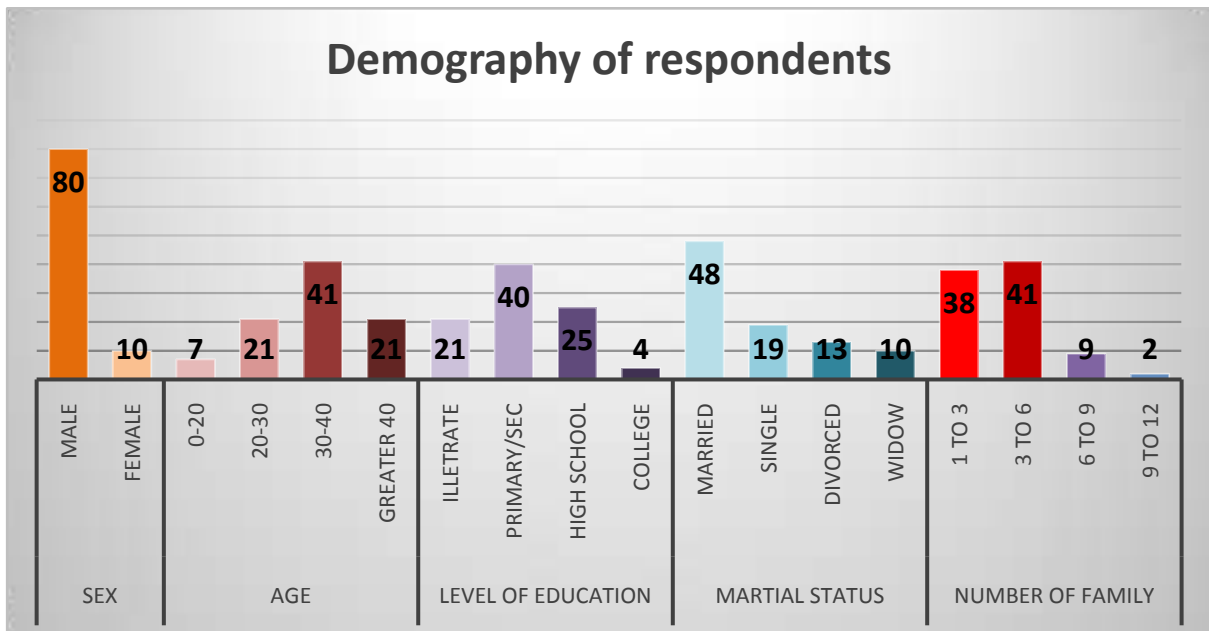


Graph 1; Knowledge and perception of owners towards lose due to EZL

At least 6 hours a day and 24 hours in a month is required for two months for a horse to be free of EZL or to become severely infected and lead the horse to euthanasia according to the result from this study. This means that the owner was losing ETB 528.00 per month while spending his time at vet clinic. Total lose in their working experience is about ETB 390,000.00(Graph 1). This is resulted from multiplying number of owners lost their horse due to EZL by current price of a horse. About 83.3%, 74.4% and 70% of the owners responded to this survey were totally dependent on the cart taxi business (they don't have additional job because they are mostly illiterate ) , have dependent family member waiting for the income from the cart taxi business and sending children to school with hoping income from the same business respectively. 45.6% of the respondent have 3-6 children and still at young age 45.5%, potential to give birth (Graph 2, table 2), and also the future fate of this community would be under question. So that the impact of EZL is multi-dimensional it has a negative effect on the horse drawn taxi owners, owners' family and beneficiary community living where the road is not accessible for motorized vehicles (table 2).

Table 2; Dependency on the cart taxi business through different aspects

variables	Owners response	Frequency	Percent (%)
Having additional job	No	75	83.33
	Yes	15	16.67
Having dependent family	No	23	25.6
	Yes	67	74.4
Children sending to school	No	27	30.0
	Yes	63	70.0



Graph 2; Demographic information of respondents

## **Conclusion and Recommendation**

### **Conclusion**

The study shows that EZL is economically and socially important disease of horses due to debilitating the pulling capacity of horses-animals very important for the sustainable life of the cart taxi owners. This study also revealed the time-money values implication on the owners, which means owners the spending their time at the clinic, the more money they spend for treatment and feed sick horse the more they give rest to the EZL infected horse; the more they lose every asset they have become poor. Direct financial and asset lose was absence from work, and death of EZL affected horses. The study identified that EZL is economically important health problem of carthorses in Bishoftu which menacing the life of cart taxi business owners and poses severe economic crisis to the dependant community.

The business is almost totally owned and run by the male group. Horse are more treated free of charge by the animal welfare charity organization, however, most of them fail to be cured of the disease because of ineffective antifungal medicine and lack of management (Ameni and Siyoum, 2002). The owners obviously acknowledged the negative impact of the disease on the income generation means of their family so then direct impact on their livelihood collectively (table 2 and Graph 1).

### **Recommendation**

In the light of these facts the following recommendations are proposed:

- Motivating and engaging the community planning towards the other income generating activities such as urban agriculture and small scale farms to make the life of the owners and dependents sustainable.
- Awareness enhancement education should be provided to horse owners and drivers and to the public for early treatment of horses showing signs of EZL and preventive measures. Low-priced and effective antifungal drugs should be sought to treat the disease which will be readily available to equine owners and drivers both in government and private animal health sectors.
- Local government Animal Health Research Offices and concerned NGOs should give attention to work together towards the development of an effective vaccine in order to tackle this highly spreading disease.

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