Research Paper

Economic Importance of the livestock Sub- Sector: A Case Study of Magu District, Mwanza Region.

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Abstract:
The main aim of this paper was to examine the importance of sector on household sector in Magu district. The study sample included one hundred livestock keepers from five wards. Both secondary and primary data sources were used. Survey, questionnaires and interviews were used to collect the data. The study used a descriptive design approach to analyse the data. Econometric model was used to assess the relationship of the importance of the livestock sector keeping and the economy of household in the study area. The results suggested the importance of both livestock keeping and its contribution to household income in the study area. The results also found that there was a positive contribution of the sector to household Income. The study recommended that education on the importance of modern (Zero) livestock keeping could make difference in livestock keeping in the area, given its use intentionally.
Key Words: Livestock Contribution, Economic growth, Sector, Descriptive Approach, Magu District Mwanza, Tanzania

I.   Introduction.

Livestock is a key Sub-sector in Tanzania which contributes significantly in the economy. However, available statistics show that the current contribution of the sector in the economy is still far below its potential. Globally, according to (FAO, 2009), the Sub- sector contributes 40 percent of the global value of agricultural output and supports the livelihoods and food security of almost a billion people. The sub-sector is the fastest growing of all the agricultural sub-sector. About 36% of farm household are engaged in livestock-keeping, 1% is livestock farms and 35% as crop-livestock mix farmers (URT, 2007). The Sub-sector contributes 5.9 % of the country's GDP. In Africa, Tanzania has the third largest stock of livestock after Sudan and Ethiopia. However, despite her favorable ranking, the sector is yet to attain full potential for its

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contribution to the economy. Parts of the reasons include the low level of production and reproductive rates, poor breeding types, poor quality of products and from the industry (URT, 2007).

The Sub-sector acts as a source of Income and employment to the smallholders farmers and contributes highly to food supply and food security. The sub-sector provides manure and animal drought power to the crop production. In fact, the sector provides economic linkages with other sectors of the economy, and contributes to household asset, saving, livelihoods etc. The literature shows that the sector is significantly linked to the transport sector and other agricultural sectors, and plays a notable role in economic diversification (Moyo, 2010).

Tanzania is one of the richest in livestock resources as it ranks third in Africa after Sudan and Ethiopia in livestock population (FAO,1999). The types of livestock include Cattle, goats, sheep, pigs chicken, ducks turkeys, rabbits and donkeys. According to (FAO,2017), cattle is the leading one with 21,280,875 heads and 15,154,121 heads of goats, sheep are the third with 5,715,549 heads, pigs the fourth with 1,584,411 heads while the number of chickens amounts to 43,745,505.Lake Zone specifically Shinyanga, Mwanza, Geita, Tabora, and Musoma regions have the highest livestock population in Tanzania. Notably, 99.9% of Tanzania's livestock is

kept by small holder farmers while large scale farm remain insignificant. Livestock population in Tanzania is comprised of 25 million cattle, 98% of which are indigenous breeds (URT, 1999).

Magu District in Mwanza region is one of the most highly livestock populated areas in Tanzania. However, like in other areas, Livestock keeping in Magu has recently been experiencing such challenges as shortages of grazing land, severe diseases and parasites, inadequate veterinary service and low milk production potentials especially for the indigenous cattle, therefore adding to the major constraints affecting productivity the sector. Some of the causal factors include expansion and intensification of crop production, deforestation and Urbanization within the region. In addition, the increase in global climatic changes, pastoral management reduced rainfall and increased drought reduce productivity of rangelands and hence food insecurity (FAO, 2018). Globally, livestock production contributes about 40% of the agricultural outputs supports the livelihood of almost a billion of people (FAO, 1994). Given the above background, this study investigates the economic importance of livestock to the economy of Magu District, Mwanza region using a descriptive approach.

1.1 The Problem statement
In Tanzania, the livestock sub-sector has been contributing about 5.9% of the GDP. This rate is very low considering the size of the Sub- sector in terms of livestock population in the country. The subsector supplies food provides manure, industrial inputs such as milk, hides and skin skeletons, eggs, etc. The sector is associated with direct and indirect linkages to the rest of the economy (URT, 2007). Despite of its primary role in the economy, contribution of the Sub- sector in food security, employment (job creation) has not been adequately explored. This remains to be a problem to be considered by this study, it is argued for the full potential of livestock sector to be explored, and policies should promote the role of smallholder livestock farmers. Furthermore, the contribution of this sub-sector to (GDP) the national economy has been greatly under valued, but its contribution could be very significant if the farmers and government pay more attention by allocating significant resources to the industry. Magu is one of the districts in Tanzania which keeps large herds of cattle and the modality of raising livestock and specie is a traditional one (URT, 2007). As a result, it does not encourage large output from livestock industry given the challenges facing it. The sub-sector could lead the other sectors in terms of productivity if the challenges' facing this sector is well addressed and solved. The low livestock growth rates and high animal mortality rates leads to low quantity and poor quality of the final products from the industry which needs investigation and explanation. Livestock species play very important economic and socio-cultural roles for livelihood of rural households. Therefore it is important to examine the importance of livestock to the economy of Magu district.

1.2 Objective of the study
The overall objective of this study is to assess the economic importance of livestock sector in the household economy of Magu District, Mwanza.

Specific objectives include:
(1) To analyse the perception of the community on importance of livestock keeping
(2) To evaluate the contribution of livestock production Income to total household Income
(3) To examine challenges facing livestock keepers in Magu district and provide recommendations for addressing them.

1.3 Study questions
1) What is the perception of the community on importance of livestock keeping?
2) What is the contribution of livestock production Income to household Income?
3) What are the challenges facing livestock farmers in Magu District and what recommendations can be identified for policy action?

II. Literature Review
Livestock sector is an important sector in the economy as it supports and links all other sectors in the economy. It provides products and services such as meat, milk, fibre; eggs, hides and skins, fuel, natural fertilizers, transportation, farming, and drought power etc. They are kept to all most more than half of the rural households. In the household it is essentials to livelihoods, nutrition and food security. In fact if managed properly they can contribute to ecosystem functions such as nutrient cycling, soil carbon. Conservation of agricultural landscapes, all these if combined, livestock keeping can improve livelihood and Income. Livestock and agro ecology, are directly related they can support the transition towards sustainable food and agriculture (FAO, 2017)

2.1. Roles of livestock to household Income

Livestock has much has much concern to the impact of the livestock on the climate and the environment. Livestock enhances food security and nutrition of the public at the large extent of the rural and urban low income earners by enabling them access to food nutrients such as milk, meat and eggs .Livestock is the key livelihoods of small-scale farmers particularly women, by providing them Capital ,income, fertilizer (natural fertilizer),fuel, drought power ,fibres, hides and skins. Livestock provide manure, which is rich in plants nutrients and organic matter which is the key to the physical, chemical and biological properties of healthy soils. Livestock increases plant biodiversity in grassland which in turn provides productivity, resilience and other ecosystem services. Livestock provides solution to climate problems as it reduces methane emission in the soil and increases resilience in the soil (FAO,2009).

Livestock production as a sub-sector in agriculture has contributed about 40 percent of global agricultural value output. It is said to support livelihood of billions in world (FAO, 2018). About 50 percent of the livestock grazing land in the world is supported by the dry lands which is obtained in the semi-arid and arid land which forms about 30 percent of the world's land surface (Barret, Reardon&Webb, 2001).Lake Value Basin practices indigenous beef cattle production system, which involves cattle grazing on natural pastures. The system is characterized by overgrazing system, low livestock production and soil degradation (Mpofu 1998), Urbanization expansion within lake Victoria basin, deforestation, intensification of crop production system has raised a major challenges to the system (Matima et al 2010)

2.2. Challenges to Livestock- keeping in Magu District
● **Changes in livestock routes in Magu district;**
Water and Pasture availability and livestock routes has changed due to climate change. Stock routes were used by livestock by water sources and pasture land, but now have become roads and other blocked by houses due to urbanization. However Urbanization has resulted to decline of Pasture land. The changes in livestock routes in response to changes in grazing land and water sources, this type of land use has resulted to conflicts (Engida , Guthiga, &Karugia, 2015; Ernest, Hagai, &Kashagali, 2015).
● **Changes in land cover**
There has been lost of forest and wetland vegetation, example Kiseke area, this was caused by increase of settlements, Institutions, farm lands and woodlots as the results of population increase. This has resulted both decreases in grazing land and water sources for livestock. Due to increase in human being settlement has resulted to narrowed areas causes livestock invade crops. A good example is in Kabila Village, which has changed in stock routes in relation to water availability and pasture of livestock used in this area. (Siwa, Hagai&Kashaigili. 2015)

2.3 Conceptual frame work

Tanzania census of 2012 recorded Magu district population as 299,759; the population growth is associated with decrease in pasture and farming areas leading to inefficient and poor livestock products. This draws attention to look into how traditional livestock keepers can adopt new and improve the traditional way of keeping livestock efficiently and improve its products to support high demand for the growing population and improve income levels. This study is specifically carried out in Magu district using primary data and secondary data to identify how traditional way of keeping livestock is efficient? Role of the livestock in house level Income and problems facing livestock keepers. It is thought that livestock sector alone can provide substantial support on household Income. The diagram below illustrates variables contribute to the income level of Magu (URT, 2013)

Figure: 1. Contribution of livestock to the economy of Magu District
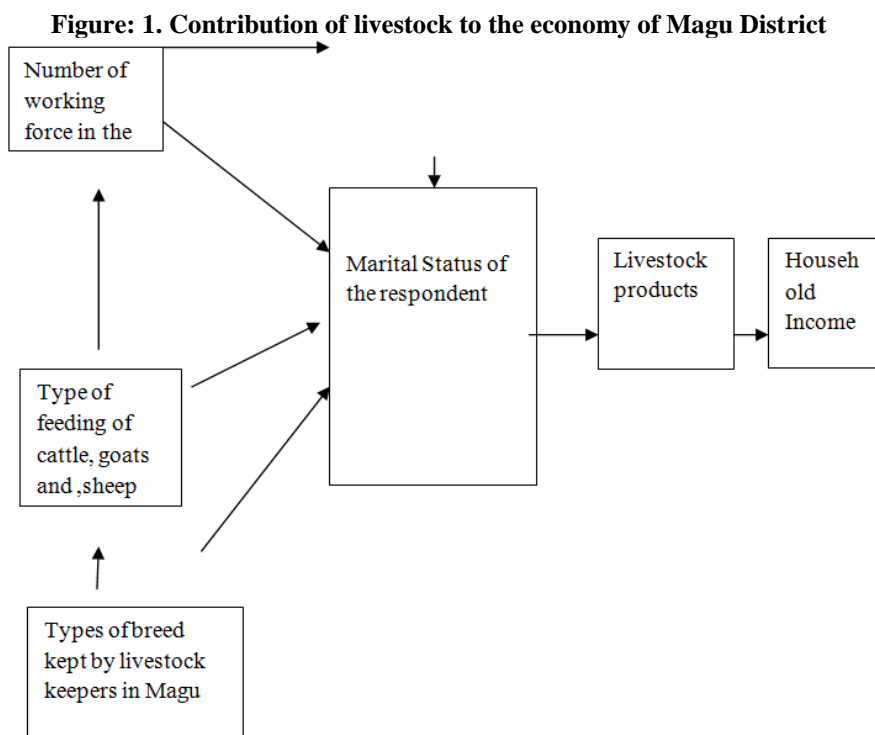
Source: Field work (2021)

III.   Methodology

Research Methodology refers to the proposed research design, population and sample, data collection procedures, data analysis procedures and sometimes measurement of variables (Mugenda, 2003; Kothai, 2006). This section explains the way the study is conducted which will involve sampling procedures and the data collection.

3.1 Research design

Singh (2006) described research design as the mapping strategy of the components of the study. It is a plan for collecting and utilizing information by interviewing or administering a question to a sample of individuals. Thus this study will adopt a descriptive survey design in which Qualitative data analysis is used (Akhtar, 2016; Atalin, 2013). This is an analysis of words or images and is often a more flexible process that involves the researcher's subjective judgments. It might focus on identifying and categorizing key themes, interpreting patterns and narratives, or understanding social context and meaning in Shona.   So the Contributions of livestock to the economy of Magu were investigated using a descriptive approach making use of tables, graphs and inferential and descriptive statistics to some extent (Barker, 1994; Bogdan &Biklen, 2006).

3.2 Study area

The study will cover Magu district assessing the contribution of the livestock sector in the   economy of Magu district, North is bordered by lake Victoria and Busega District, East boarded by Bariadi District, South by Itilima District, Maswa District, Kwimba District and Misungwi District. Magu is located between latitudes $2^0 10^1$ and $20^0 50^1$ South and longitude 33^0 and 34^0 East in Mwanza region. The district has tropical temperatures ranging between 25^0 and 30^0C.The rainfall spreads from October to December and March to May and it experiences rainfall ranges from 700mm and 1000mm. Temperatures and rainfall are strongly influenced by proximately to Lake Victoria and the equator. The national population and Housing census estimated human population at 299,759 while cattle population was 320,163 in 2005/2006 fiscal year (URT,1999).The most leading economic activity in Magu is agriculture, the main cash crops and food crops grown in are cotton, paddy, maize, sorghum, sweet potatoes, cassava, pulses and horticulture crops such as tomatoes onions and fruits, livestock in the area include cattle, goats, sheep, and chicken (URT, 1999) see Figure 2.

Figure 2: Magu Disatrict, Mwanza Region, Tanzania

Source: https://en.wikipedia.org/wiki/Magu_District

Magu Districtis one of the seven districts of the Mwanza Region of Tanzania, East Africa. Its administrative centre is the town of Magu, on the SimivuRivcer. It is bordered to the north by Lake Victoria and Busega District, to the east by Bariadi District, to the south by Itilima District, Maswa District, Kwimba District, and Misungwi District, and to the west by the city of Mwanza, which consists ofNyamagana District and Ilemela District..

3.3. Sampling Procedure.
This study used cluster sampling procedure and simple random sampling. The five wards were divided as clusters including Magu Town. These wards are characterized with Livestock keeping and farming. The researcher surveyed twelve households from each ward and each ward heard of the house either Man or Woman was interviewed. To get the practical traditional cattle keepers, the researcher also surveyed Washing deeps, to observe cattle, sheep, and goats been treated. Livestock keepers were interviewed and provided their answers.

3.4 Sample Size:
The study used a Sloven's, (1960) formula, to calculate the sample size. The formula was based on the Slovens rule and was used in this study to select sixty one livestock keepers from the five wards of the study.

3.5 Data collection
This study is based on secondary and primary data sets obtained from various sources, such as government department reports, magazines, questionnaires and interview and discussions with extension officers, livestock buyers, and internet search. The information was the organized to meet the requirement of the study. The data was then classified into different groups of small holders following their state of marketing and costs. The study used a simple random sampling technique and applied it to small population rather than large region's rural community was then considered to be adequate for the purpose of the study in the selected Wards.

3.6 Econometric model
The study used econometric model to assess the relationship of the importance of the livestock sector keeping and the economy of household in Magu .The general mathematical equation considered was expressed as:

3. 6.1. Mathematical equation

$$H_I = L(T_f, T_b, G, N_f, M_s D_{IJ}, \mu) \dots\dots\dots\dots\dots\dots (1) \qquad \text{Where:}$$

- H_I ~ Household Income
- T_f ~ Type of feeding
- T_b ~ Type breeding
- G_G ~ Gender of the respondent
- N_f ~ Number of the working force
- M_s ~ Marital status

- D_{ij} ~ Dummy Variables
- D_1 ~
- D_2 ~
- D_3 ~
- μ_i ~ Unobserved characteristics

The specified model is given as below;

$$H_I = \beta_0 + \beta_1 N_f + \beta_1 D_1 + \beta_2 D_2 + \beta_3 D_3 + \ldots\ldots\ldots\ldots\ldots\ldots\beta_{17}.D_{17} + \mu_i \ldots\ldots\ldots\ldots\ldots (2)$$

The analysis used OLS estimator to establish relationship of the house hold economy and Livestock keeping in Magu District.

4.1. Findings and Discussion
4.1.1 Descriptive Statistics
The analysis was conducted using statistical package for social science, SPSS (20), the variables were explained using descriptive method and inferences were conducted at 95% confidence level.
4.1.2. Demographic Variables
The distribution of demographic variables is as shown in Table 1

Table1. Distribution of demographic variables

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender of the respondents	Male	48	78.7	78.7	78.7
	Female	13	21.3	21.3	100.0
	Total	61	100.0	100.0	
Group of ages of respondents	age grp 18-28	16	26.2	26.2	26.2
	age grp 29-39	7	11.5	11.5	37.7
	age grp 40-50	13	21.3	21.3	59.0
	age grp 51-60	16	26.2	26.2	85.2
	age grp 61 and above	9	14.8	14.8	100.0
	Total	61	100.0	100.0	
Marital status of the respondents	Married	43	70.5	70.5	70.5
	Single	17	27.9	27.9	98.4
	widowed/separated	1	1.6	1.6	100.0
	Total	61	100.0	100.0	
Occupation of the respondents	Informal employment	1	1.6	1.6	1.6
	Livestock-keeping	17	27.9	27.9	29.5
	Farming	4	6.6	6.6	36.1
	more than one	39	63.9	63.9	100.0
	Total	61	100.0	100.0	
Group of level of education	not attended to school	12	19.7	19.7	19.7

	primary education	45	73.8	73.8	93.4
	secondary school	2	3.3	3.3	96.7
	advanced secondary school	1	1.6	1.6	98.4
	university education	1	1.6	1.6	100.0
	Total	61	100.0	100.0	

Source: Field survey November 2021.

Table one presents demographic variables. 78 (48%) of the interviewed livestock keepers were men, while 21.3 (13%) were female. Traditionally men here are herd of the household and they take overall role in livestock keeping. About 26.2(16%), the age of 18-28 years and 51- 60 years found as, the age engaged more in livestock keeping. 70.5 (43%) interviewed were married, only 27.9(17%) were not married. Married people had an advantage of large working force .The large the working force in the household the large the herd of cattle, sheep and goats the household keep.63.9 (39%) of livestock keepers had more than one economic activities while 27.9(17%) do only livestock keeping. About 73.8(45%) interviewed had primary education while 19.7(12%) not attended to school at all. This shows that good percentage of the interviewed livestock keepers had primary education.

4.1.2. Objective One: Findings
This objective required the study to focus on analysis on the perception of the community on the importance of livestock keeping. The findings are shown in Table 2

Table.2. The roles of livestock to the households income

The roles of livestock to the household income		Frequency	Percent	Valid Percent
Provides income	very high	44	72.1	72.1
	High	14	23.0	23.0
	very low	2	3.3	3.3
	Low	1	1.6	1.6
	Total	61	100.0	100.0
It is one of the food security to household	very high	27	44.3	44.3
	High	25	41.0	41.0
	very low	3	4.9	4.9
	Low	3	4.9	4.9
	No contribution	3	4.9	4.9
	Total	61	100.0	100.0
It is the main source of household income	very high	30	49.2	49.2
	High	25	41.0	41.0
	very low	3	4.9	4.9
	Low	2	3.3	3.3
	No contribution	1	1.6	1.6
	Total	61	100.0	100.0
It provides manure and animal drought power	very high	27	44.3	44.3
	High	18	29.5	29.5
	very low	9	14.8	14.8
	Low	5	8.2	8.2
	No contribution	2	3.3	3.3

	Total	61	100.0	100.0
It is one of the savings facility	very high	37	60.7	60.7
	High	16	26.2	26.2
	very low	2	3.3	3.3
	Low	4	6.6	6.6
	No contribution	2	3.3	3.3
	Total	61	100.0	100.0
It is used for ritual purposes	very high	8	13.1	13.1
	High	10	16.4	16.4
	very low	19	31.1	31.1
	Low	11	18.0	18.0
	No contribution	13	21.3	21.3
	Total	61	100.0	100.0
It is used for social status	very high	19	31.1	31.1
	High	5	8.2	8.2
	very low	5	8.2	8.2
	Low	12	19.7	19.7
	No contribution	20	32.8	32.8
	Total	61	100.0	100.0

Source: Field Survey November, 2021

Table 2 above, illustrates the community perception on the importance of keeping livestock, It was found that (44) 72.1% of the surveyed people responded that livestock provides income to the household. (27) 44.3 %   said that it is one of the food securities in the household. Livestock keeping in Magu and Mwanza region is an important economic activity for a large part of the rural population, the rural community in the region relies on livestock to fulfil their social as well as their economic needs (URT, 1997). From the survey, livestock keeping is the main source of household income by (30) 49.2 %. (27) 44.3% found that, Livestock keeping provides manure and animal drought power to the household. About (37) 60.7 % of the surveyed household showed that livestock keeping is the main Source of saving facility in the household. The surveyed household (8) 13.1% said that livestock like cattle, goats and sheep are kept for ritual purposes while (19) said that 31.1% kept for social status. This sector is an important one as it links to other sectors or to activities in the economy, especially with other agricultural activities through provision of manure and animal drought power (FAO, 1999). According to FAO (2007) livestock population is estimated to generates total quantity of animal products such as milk, animals for slaughter, and manure proceed by the household herd livestock products are valued in prices and assigned monetary value that expressed in country's currency.

4.1.3 Objective number two:
To evaluate the contribution of livestock production to total household Income

Table 3: Contribution of livestock production to total household income

Coefficients		Un-standardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9833830.886	3770771.271		2.608	.012
	number of working forces in the household	-33535.292	45485.291	-.138	-.737	.465
	Dummy variable wrt Married	-476397.555	2259919.199	-.096	-.211	.834
	Dummyvariablewrt Single	-681580.411	2508993.776	-.135	-.272	.787
	Dummy variable wrt Male	-33906.985	785676.189	-.006	-.043	.966
	Dummy variable wrt not attended to school	-6738456.382	2632754.533	-1.187	-2.559	.014
	Dummy variable wrt Primary education	-6135701.616	2648075.129	-1.196	-2.317	.025
	Dummy variable wrt Secondary	-5224953.149	2930595.334	-.412	-1.783	.082

education					
Dummy variable wrt to advanced education	-7192949.088	3273627.701	-.405	-2.197	.033
Dummy variable wrt Age group 18-28	190964.381	1504687.340	.037	.127	.900
Dummy variable wrt Age group 29-39	-62812.700	1126662.544	-.009	-.056	.956
Dummy variable wrt Age group 40-50	-405406.928	935034.035	-.074	-.434	.667
Dummy variable wrt Age group 51-60	975386.377	951118.139	.190	1.026	.311
Dummy wrt Traditional in case of cattle	1608861.519	1160301.551	.300	1.387	.173
Dummy wrt Traditional - in case of goat	255779.832	739987.474	.054	.346	.731
Dummy wrt Traditional- in case of sheep	-1985777.742	1036745.188	-.401	-1.915	.062
Dummywrt Zero Grazing	1364248.785	2112840.205	.193	.646	.522
Dummywrt Self grazindg	-1836838.908	1600877.286	-.289	-1.147	.258
a. Dependent Variable: income					

Source: Field Survey October 2021.

The table above explained determinants of the livestock production in the household Income in Magu District. The estimation of the variables showed that, people not attended to school were significant as P-value 0.014, tested at 95% level of significant. People not attended to school showed that livestock production has significant role in household income. People in single was also found to have significant contribution to the household income, the variable estimated at 95% and was significant, as P-value 0.025 was less than 0.05, level of significance. People with formal employment, P-value was 0.033 when tested at 95 % level of significant, and thus found also to be significant, that livestock has positive contribution to household income in Magu District.

4.1.4. Objective Three .To asses challenge facing Livestock keepers in Magu District.
Table.4 -The challenges facing Livestock keepers in Magu District

If yes what problem do you face?		Frequency	Percent	Valid Percent	Cumulative Percent
	Death	4	6.6	6.6	6.6
	drought and diseases	2	3.3	3.3	9.8
	drought and shortage of grazing area	1	1.6	1.6	11.5
	drought and Shortages of grazing area	2	3.3	3.3	14.8
	drought, capital and shortage of grazing area	2	3.3	3.3	18.0
	lack of incentives	3	4.9	4.9	23.0
	no Market for meat and low Capital	1	1.6	1.6	24.6
	Non	16	26.2	26.2	50.8
	pests and diseases	3	4.9	4.9	55.7
	pests and drought	1	1.6	1.6	57.4
	pests, theft and being ate by wild animals	1	1.6	1.6	59.0
	pestisides and shortages of grazing area	2	3.3	3.3	62.3
	shortage of grazing area	18	29.5	29.5	91.8
	shortage of grazing area, source of water, pest and diseases	4	6.6	6.6	98.4
	shortage of grazing areas and diseases	1	1.6	1.6	100.0
	Total	61	100.0	100.0	

Source: Field survey November 2021.

Table 4, above explains problems face livestock keepers in Magu district. Growing population has led to high demand for land for agricultural activities. This is what is taking place in Magu district, agriculture sector pushing away livestock keepers. So most land being dedicated for farming, residence, and commercial activities, (18) 29.5 % of the interviewed livestock keepers showed that, main problems facing them is shortage of grazing area, while (16) 26.2 % did not respond. This sector is one the sector in Tanzania, difficult to deal with because of its traditional and sociological background of the cattle owners (URT, 1997), Despite of its importance contribution to household, the sector has been growing very low and as well, its contribution to the regional GDP. In Magu district drought, Pests, diseases, Pesticides, theft, lack of enough market for their livestock output has demotivated people to improve the sector. In long dry season all efforts put to improve the livestock except Chicken becomes zero. Cattle, sheep and goats suffer from lack of water and grass to feed.

According to FAO (2017), Urbanization, rising Incomes and changing lifestyle are driving growth in demand for standardized products at low prices. Magu District is one of the area population pressure is pushing Magu town to grow and change people' life to Modern life from the traditional one.

Table 5. Awareness of Modern way of livestock keeping

Awareness of modern way of livestock keepiping		Frequency	Percent	Valid Percent	Cumulative Percent
Do you know the modern way of livestock keeping	Yes	34	55.7	55.7	55.7
	No	27	44.3	44.3	100.0
	Total	61	100.0	100.0	
If Yes, do you have plan to change from traditional to modern	Yes	30	49.2	49.2	49.2
	No	31	50.8	50.8	100.0
	Total	61	100.0	100.0	

Source: Field survey November 2021.

The above55.7 (34) % of the interviewed livestock keepers said that, they are aware of the modern way of livestock keeping, while 44.3% said, they, don't know. So 49.2 (30)% said had plan to change from traditional to modern way of livestock keeping, 50.8 (31)% said, do not have plan to change to modern way of Livestock keeping, since the modern type of Livestock is expensive and need more technologies.

Table: 6. Type of breed system undertaken by livestock keepers in mage district

Type of breed system		Frequency	Percent	Valid Percent	Cumulative Percent
What type of breed do keep in case of cattle	traditional one	47	77.0	77.0	77.0
	Hybrid	4	6.6	6.6	83.6
	Non	10	16.4	16.4	100.0
	Total	61	100.0	100.0	
What type of breed do keep in case of goat	traditional	40	65.6	65.6	65.6
	Hybrid	5	8.2	8.2	73.8
	Non	16	26.2	26.2	100.0
	Total	61	100.0	100.0	
What type of breed do keep in case of sheep	traditional	43	70.5	70.5	70.5
	Hybrid	2	3.3	3.3	73.8
	Non	16	26.2	26.2	100.0
	Total	61	100.0	100.0	

Source: Field survey November 2021.

From the above table, 77 (47) %, keep Traditional cattle, while only 6.6 (4) %, keep hybrid type of cattle. 65.6 (40) % said that they keep traditional type of goat, and 26.2 (16) % keep hybrid. The study found that very few households keep large number of goat, those keep only manages very little number of goats.70.5 (43) % interviewed keep traditional type of sheep only, 3.3 (2) keeps the hybrid. It was established that very few households keep goats for the reasons that goats needs large area for feeding compared to sheep.

Table 7. Type of feeding of raising livestock in Magu

what type of feeding do raise		Frequency	Percent	Valid Percent	Cumulative Percent
	zero-grazing	7	11.5	11.5	11.5
	self-Grazing/herding	52	85.2	85.2	96.7
	Rotational grazing	2	3.3	3.3	100.0
	Total	61	100.0	100.0	

Source: Field survey November 2021

85.2 (52) % of the interviewed livestock keepers said, they use traditional way of feeding (grazing) or animal feed themselves, from on an open space while 11.5 (7) % feed on Zero-grazing. Feeding livestock (Cattle, sheep and goats) with Zero grazing is very difficult (very expensive) to practice in Magu area, because the area experiences, long drought season in a year, from end of April to middle of November every year.

4.2. The regression results

The results showed that, real livestock keeping in Magu District has significant contribution to the household Income when the variables were tested at 95% level of significant. Variables detected to have significant values were proxy variable, people not attended to school and People with smaller family number or in single showed that livestock production has significant role in household as one main source of Income in district.

IV.   Conclusion and policy implications

5.1 Conclusion

This study put emphasis particularly on the household income and Livestock keeping in Magu district. The study established how far the livestock keeping in Magu district has contributed to household Income;

First, the study found that livestock has positive roles to the household Income, 72% of livestock keepers said that livestock is the main source of household income, which obtained from different products like milk, hides and skins and meat etc.It is taken as one of the food security in the household, also as the main of saving facility; wealth of the household is kept in livestock. Livestock sector as a sub-sector in agriculture is directly linked to development of Magu; livestock provides manure which is the key determinant of agricultural output. Livestock is used in pride-price and for ritual ceremonies, and lastly they said it is a proud for a household to have large herd of livestock particularly Cattle or goat and sheep, but this proud is polluted by many challenges facing the sub-sector in Magu district, Mwanza Tanzania.

Secondly, taking into consideration of the livestock production to household Income, the study used different variables as a proxy for married, Gender, type of breeding, type of feeding, gender of the respondents and Marital status. The study found that married people, and not married, people with formal employment are one of the determinants which found to have positive effect or significant to the household Income

Thirdly: The findings pointed out some challenges facing livestock keepers in Magu district which underneath are listed:

● Global climate changes has led to increase in the Pastoral Management challenges as illustrated also by (Asner et al, 2004 cited in Jackby, 2011). The problem has led to shortages of grazing area, which is regarded as the main factor. Increase in population and increase in demand for farming area has led to shortages of grazing area

● Decrease in rainfall and increased sometimes extended drought have reduced drastically natural grazing land in Magu district and primary productivity of land and thus food insecurity and limited household Income as also illustrated by (FAO, 2009)

● Water availability in Magu district especially during to a drought season has become another among main challenge to endogenous livestock production in Magu district which has led to low yield in Livestock production

● Lack of incentives, like government supports in terms of animal medical support and other medical facilities to manage Pests and Diseases

● Low markets for livestock products like hides and skins, eggs ,fresh milk and other products, Markets of these products could be incentives to the livestock keepers

Fourthly: The study found that a number of interviewed, are aware of modern way of livestock keeping, but the type of breed is expensive and the environmental nature does not favour such livestock keeping as also associated to global climate change.

Fifthly; With relation to endogenous breeding system, the study observed that traditional breed is commonly kept compared to dairy cattle or breed beef cattle, in fact modern beef cattle type was found to nobody keep. Reference is taken to environmental climate associated with long-drought and shortage of grass to feed, many households keep traditional cattle which manages the climate and the same time is cheap to feed. Self-gazing is the main type of livestock keeping in Magu district

5.2 Policy implications and recommendations

This study would prefer to provide the following, as policy guidance and recommendations;

• Government should improve animal medical clinics and their associated veterinary facilities like ''washing deeps'' which found in some areas are out to date (they do not exist) and the existing ones are poor and are operated through contribution from livestock keepers themselves. The deep Wash will help to eliminate or reduce drastically the problem of pests and diseases

- Education on importance of modern livestock keeping like dairy cattle must widely been provided to livestock keepers and in general to farmers
- Livestock sector generally is an important sector that supports agricultural sector in terms of inputs and commerce. This sector must intentionally be motivated, like modern livestock keeping which will cover very small area in terms of feeding and it will be profitable to both household and to the government

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APPENDICES
Appendix 1: ANOVA TEST FOR MODEL FIT

ANOVA						
Model		Sum of Squares	Df	Mean Square	F	P-VALUE
1	Regression	140313483119913.03	17	8253734301171.355	2.086	.026
	Residual	170179441732545.84	43	3957661435640.601		
	Total	310492924852458.90	60			
a. Dependent Variable: income						

Test for normality assumption on dependent variable

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	Df	P-VALUE	Statistic	df	P-VALUE
income	.231	61	.000	.713	61	.000

Lilliefors Significance Correction