The Contribution of Urban Livestock Keeping to Food Security in Arusha City: A Case Study of the Three Wards: Daraja Mbili, Sombetini and Sokoni One

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ABSTRACT

This article examines the contribution of urban livestock keeping to food security in Arusha city, taking the case study of Daraja Mbili, Sombetini and Sokoni One; random sampling was applied in the selection of the wards. The main focus was identifying the main urban livestock kept in the study area, to examine the contribution made by the different farming categories, and to investigate the relationship between livestock keeping and food security in the areas selected. The sample selected was 200 households of different ages and genders, and snowballs and judgemental were applied. Data was then collected using questionnaire, interviews, observation and focused group discussions. The information was processed and filtered for analyses. Analyses tools used were SPSS and Microsoft excel. Different types of livestock kept at the study area were identified, examined and analysed. It was observed that there is a positive relationship between urban livestock keeping and food security. In other words, urban livestock keepers had potential benefits in keeping dairy cows, goats, sheep, doves and ducks. The result stipulated the contribution of each variable examined. Dairy cows had much contribution than others, milk production surpassed by average of 1-15 litres per day. Large amount of milk produced is 11-20 litres with 40.4 %, followed by 1-10 litres with 24.8 %. Milk was sold and other portion used by family members. The price of one litre of milk was sold by 1600/=Tsh, therefore a farmer was able to collect more than 100,000/=Tsh per day, which has significance in food security attainment. The contribution of other livestock like goats, sheep and poultry like chickens and ducks is highly considered to supplement life cost. Several challenges of production were encounted, though many opportunities if properly utilised may reduce or remove some of the food insecurity issues.

The government is therefore consulted to support small livestock keepers in terms of the market of their produce and medical treatment when some diseases attack but also supervising the hygiene of the product since some of the farmers are not well equipped with skills of keeping animals, i.e. they use their traditional styles.

Keywords: Livestock, food security, urban agriculture, and dairy cows.

INTRODUCTION

Tanzania has maintained its position as Africa's second largest source of livestock, which has a potential to attract leather, meat and dairy processing industries. (The Citizen, Wednesday, December 02, 2020). The National Bureau of Statistics (NBS) released the Agriculture, Livestock and Fisheries Census for 2019/20, (The citizen Wednesday, December 02, 2020) which shows that the East African nation has an estimated 33.9 million cattle. Out of the number, smallholder farmers own 33.8 million cattle, and large-scale farmers have143,183 cattle, NBS chief statistician; Dr Albina Chuwa; said with these figures, Tanzania continued to rank second in Africa with the number of cattle behind Ethiopia with an average of 60.39 million cattle. The census results show that 3.1 billion litres of cows' milk and 53.1 million litres of goats' milk were produced in the 2019/20 agricultural year (https://www.thecitizen.co.tz). Mireri (2013) classified urban farmers into three categories:(1) urban inhabitants who rely on farming as an important source of food; (2) commercial urban farmers who are formally employed and engaged in farming to supplement their hitherto low wages; and (3)

those doing farming as their employment due to a weak economic base or lack of appropriate skills to participate in the modern sector.

The livestock sector contributes only 7.4% to Tanzania's GDP, which is projected to have a low growth rate of 2.6% (Nandonde et al., 2017). However, the sectors'contribution is not limited only to the GDP because it also supports the vital national services of food supply and security and provides a source of income to the smallholders, which may not be captured in the GDP (Engida et al., 2015).

Arusha region as the main focus of this article is leading in many agricultural production from cattle rearing to chicken or poultry keeping. Arusha region has seven districts as follow, Monduli, Longido, Arusha rural, Karatu, Arumeru, Ngorongoro and Arusha. Arusha is the first in ranking out 21 regions of Tanzania mainland (URT,2012).The highest proportion of cattle keeping households was in Ngorongoro district whereby 88% of its households kept cattle followed by Arusha and Longido each with 87%, Monduli (80%), Arusha Rural (72%), Meru (65%) and Karatu (56%). Therefore this study was focused in seeing the contributions of livestock keeping to food security as it is stipulated in the discussion stage.

General Objective

The general objectives of this study were to assess the contribution of urban livestock keeping to food security in Arusha city through the analysis of different agricultural practices in the city. The specific objectives that guided this study included the following:

- To identify different types of livestock and poultry keeping in Arusha city
- To examine the contribution of different types of livestock and poultry kept to food security in the urban area
- To investigate the relationship between urban livestock keeping and food security.

LITERATURE REVIEW

The Conceptual Issues of Urban Agriculture

Urban agriculture, in simple terms, is defined as the growing, processing and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities (Bailey and Nasr 2000:3). Depending on the local contexts in some city areas, it may be labelled as "urban gardening" rather than "farming “or "agriculture". UA is not limited to the production of agricultural and horticultural crops; it may also include forestry, floriculture, aquaculture and livestock production (UNDP, 1996). One of the most often quoted and now widely accepted definitions of UA comes from Mougeot (2000), who adds a little more complexity to his conceptualisation by saying:

Urban agriculture is an industry located within (intra-urban) or on the fridge (peri-urban) of a town, a city or a metropolis, which grows and raises, processes, and distributes a diversity of food and non-food products (re) using largely human and material resources products and services found in and around that urban area and in turn supplying human and material resources, product and services largely to that urban area (Mougeot, 2000:10)

Urban agriculture is generally characterised by closeness to markets, high competition for land, limited space, use of urban resources such as organic solid wastes and wastewater, low degree of farmer organisation regarding mainly perishable products, high degree of specialisation and supplying perishable products such as vegetable, fresh milk and poultry products. UA, to a large extent, complement rural agriculture and increases the efficiency of the national food system.

Arusha livestock keeping and the limited land spaces

Arusha region had a total of 1,716,514 indigenous cattle. The largest proportion (39%) were cows followed by oxen (14%), female calves (12%), heifers (10%) and steers (3%)(URT,2012). The figures show the main activities of the people of Arusha region in agricultural practising. Cow or dairy cow are taking high number

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due financial impacts they are causing in the households. Goat keeping in Arusha region ranked second after Shinyanga by contributing 12 % of total goats kept in Tanzania mainland. The farming characteristic of Arusha favours these practices mostly in the areas nearby town municipal or outskirt of the town. Sheep keeping on the other hand ranked first in Tanzania mainland while the poultry sector in Arusha region was dominated by chicken production. The region contributed 2.4 percent to the total chicken population in Tanzania Mainland. Arusha region was ranked 20th out of the 31 Mainland regions in chicken production. The number of households keeping chicken was 101,911 raising about 955,966 chickens. Poultry keeping, especially, is a major livelihood for low-income earners, contributing to food security and poverty alleviation.

Table 1: Statistics of livestock and poultry farming in Arusha

District	Cattle (%)	Sheep (%)	Goats (%)	Poultry (%)
Arusha	4	63	62	1
Meru	34	41	45	40.6
Ngorongoro	2	79	86	4.4
Longido	1	78	88	1
karatu	5	59	56	16.2
Arusha rural	52	48	42	
Monduli	2	71	81	13.8

Source (URT, 2012)

As regions are developing the land spaces become shrinking due to overpopulation and development expansion. The land for livestock keeping change from outdoor to indoor or zero grazing. Most of the farmers interviewed were found having indoor farming system; only small open spaces were used nearby household location.

Arusha livestock keeping and food security status

The rapid expansion of Arusha city in development is changing the life patterns of urban people. The value of land is constantly increasing, and it is becoming very scarce. The cost of land and prices of services change again. This, in turn, increases the vulnerability of urban dwellers to food insecurity. Hence, the option is embarking on using the open spaces to fill the gap of food insecurity that. Population increase in the city is behind all these changes.

Food insecurity is driven primarily by a prolonged dry spell and erratic rainfall that highly affected crop and livestock production pasture and water availability, coupled with crop pests and livestock diseases. These decreased crop productions in the Vuli, Masika and Msimu harvest resulted in limited food availability and access to food due to income constraints for casual labourers working on farms.

Urban Livestock Keeping concept and definition

In Arusha, urban livestock keeping plays a significant role in food security by supplementing food supplies, providing income opportunities, and contributing to the local economy. However, challenges like diseases, waste management, and land availability need to be addressed to maximize the benefits of urban livestock farming. The study by Pastory (2021) done at Arusha revealed that, despite some challenges of limited areas for livestock keeping, yet significant portion of farming was done at Daraja Mbili 10% and Lemara 5% out of crops.

According to Schiere et al. (2006), urban livestock keeping refers to the keeping of animals and birds in urban areas for economic, cultural or religious meaning. Guendel (2002) views urban livestock keeping as serving different livelihood strategies such as food security, income and employment generation, saving and insurance and social status, as well as providing easily convertible assets for covering important household expenditures (R.T.Mdendemi 2019)

Concept of Food Security and its pillars

Definition: "Food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO,2002).

This widely accepted definition points to the following dimensions of food security:

Food availability: The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid).

Food access: Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources).

Utilisation: Utilisation of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security.

Stability: To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of stability can, therefore, refer to both the availability and access dimensions of food security.

Food Insecurity in Arusha city

Food insecurity, particularly during the dry season, is a significant issue in Arusha region, Tanzania. Villagers in the region face uncertainty about feeding themselves and their families, with some villages experiencing high levels of worry about food availability. This is influenced by factors like low incomes, reliance on subsistence farming, and the effects of dry spells on crop production

In 2021, Arusha region in Tanzania faced significant food insecurity, particularly in specific councils. About 437,000 people, or 13% of the region's population, were estimated to be experiencing high levels of acute food insecurity (IPC Phase 3 or above). This included 22,000 people in IPC Phase 4 (Emergency) and 415,000 in IPC Phase 3 (Crisis). Four councils were classified in IPC Phase 3, with 20% to 30% of their populations facing high levels of food insecurity (IPC, 2021)

Food insecurity exists when people lack sustainable physical or economic access to enough safe, nutritious, and socially acceptable food for a healthy and productive life. Food insecurity may be chronic, seasonal, or temporary. Food insecurity and malnutrition result in catastrophic amounts of human suffering. The World Health Organization estimates that approximately 60 percent of all childhood deaths in the developing world are associated with chronic hunger and malnutrition. In developing countries, persistent malnutrition leaves children weak, vulnerable, and less able to fight such common childhood illnesses as diarrhoea, acute respiratory infections, malaria, and measles (Coleman, 2013).

Reasons for Focusing on Urban Livestock Keeping in Arusha region

Although most of the world's poor people in general live in rural areas, the number of urban poor, from market towns to megacities, is substantial and cannot be ignored (Garrett, 2021). The influx of people from rural to urban areas is constantly increasing. Those urban immigrants come with their rural experience for their survival in urban areas. These influxes happen in all cities and megacities of the world. Urban growth has wide-ranging implications on the enhancement of food security in cities of the future. As a result, cities have serious consequences in regard to poverty rates and food security.

Arusha city is fast growing town as it is nicknamed as Geneva of Africa. It receives influx of people from nearby regions, coming for business and looking for a job. Arusha is hub for tourism activities. The population is raising daily which increases the food demand in the market and this trigger more production in open spaces available.

Most urban dwellers possessing open spaces are actively using them to have indoor animals keeping for milk, meat, and also selling. The important reasons for livestock keeping are well-pronounced by urban dwellers themselves.

"Look here, I am keeping goat, dairy cow, sheep and chickens; when it happens I don't have money for home use, or my kids do not have excises books and other petty problems I sell one to solve the problem". One of the clients said.

Keeping livestock is of great significance to people of all age, since it provide them nutrition required by their bodies, mostly proteins and fats. But not only nutrition, it also generate income for people of low income, fertiliser for crop growth and it save as alleviator of seasonal variability of food insecurity.

Urban dwellers of Arusha are milk vendors in which they generate income through selling milk and animal dung. In many countries, cow dung is highly valued as fuel for cooking and heating, reducing expenditures for fuel wood or fossil fuels. It represents the major fuel supply for household use by millions of farmers in Asia, Africa and in parts of the Near East and Latin America. In India alone, 300 million tons of dung is used for fuel every year. The collection and drying of dung for cooking generates income for women. It is also used directly as plaster and other building materials, while its ash can is used as fertiliser.

Biogas production, manure is an excellent substitute for fossil fuel or fuel wood for farmers in tropical countries. The best manure for these purposes comes from (in descending order) pigs, cattle, horses, camels and poultry

In normal condition, those who keep animals in small spaces in urban areas mostly keep them for solving petty problems they face like cases of tuition fees, the daily cost of buying vegetables and home dues. This, therefore, derives the major reasons for livestock keeping in urban areas.

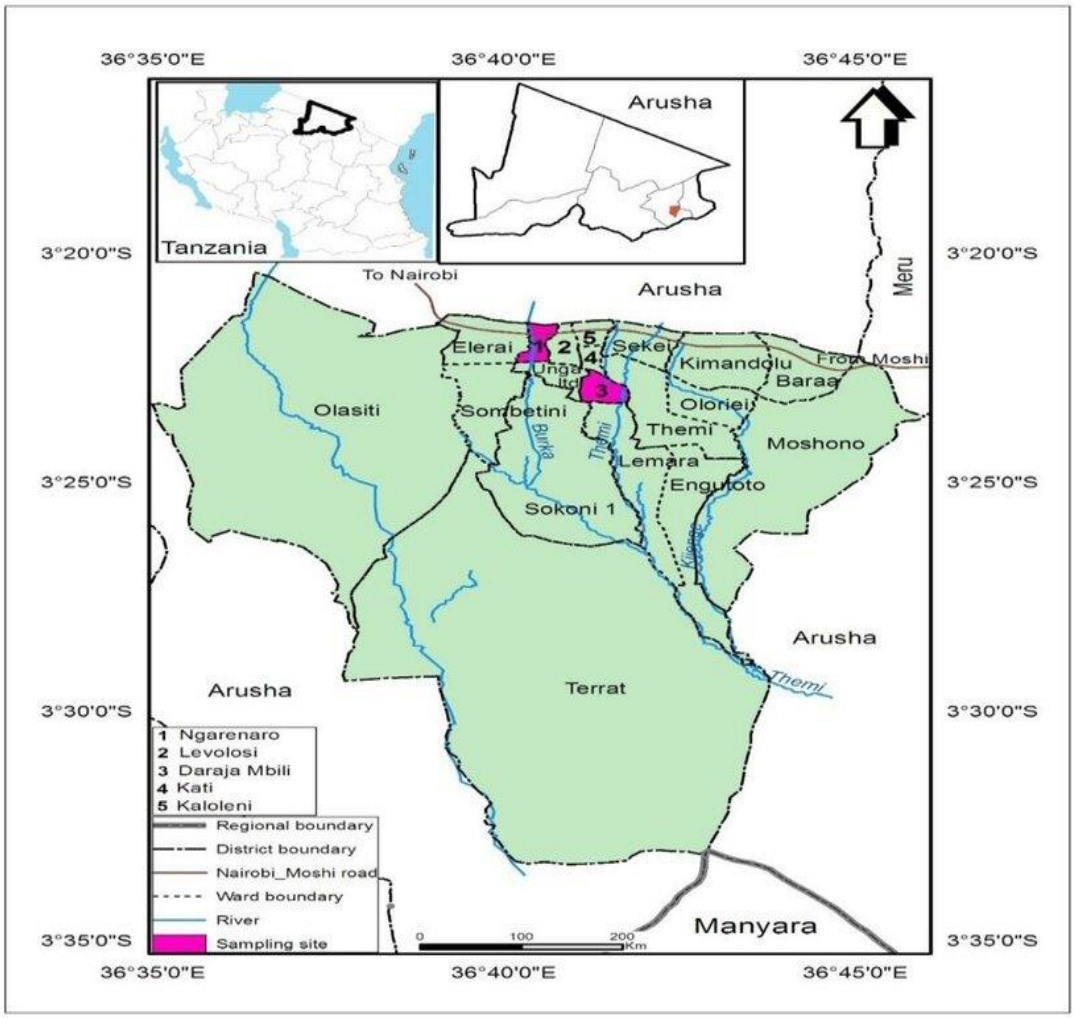
Research gap

Research done in the Arusha city mostly concentrated in vegetable cultivation and crops of which their contribution is noticed. Livestock keeping in the city is much limited by policies and regulations due to safety and cleanness management, yet the open spaces around homes of Arusha dwellers were used to operate the farming. The number of animals kept is limited by policies and by-laws though people in the study area were having number of animals exceeding accepted amount. Also the fast growing city in terms of population and in the same time limited livestock amount, this triggered the researcher to investigate the contribution provided by this farming system.

RESEARCH METHODOLOGY

Description of the study area

Arusha region is situated in the north-central area of the country and it borders on the west with Mara and Shinyanga regions, on the south-east with Manyara and Kilimanjaro regions and on the north with Kenya. Arusha City Council in Arusha Region has the largest population (617,631 persons) compared with other Councils. Over one quarter (26.2%) of total regional population live in Arusha City Council. Other two most populated Councils are Arusha District (449,518 persons) and Meru District (331,603 persons), according to National Bureau of Statistics Tanzania (NBS, 2024). The map below show clearly the location of the city in Tanzania



Source: Hambati

Sampling Techniques and Sample Size

The selection of the study area was centred on the three wards, namely Sombetini, Daraja Mbili and Sokon One. The wards are situated in less densely populated areas. Simple random sampling was used in the selection of wards. Then Judgmental and snowball sampling techniques were employed.

Judgemental sampling was used to collect information from livestock keepers from three wards; this is because the researcher knew that he will get relevant information from them. The information was collected first from the village leaders purposely because they knew the livestock keepers from their wards.

Snowball sampling technique was then employed to gather information from the households from each ward. With this approach, the researcher initially contacted few respondents and then asked them whether they know anybody practicing livestock keeping activities in their residence to recruit future subjects from among their acquaintances. This was done mainly because it was hardly possible to get the exact number of urban livestock keepers in each ward. The number of samples from each ward was decided on the basis of the proportion of the population in the three wards to the total population of study areas.

The study employed the sample size of 200 respondents from the three wards. In editing it was found that 28 respondents destroyed their response, this did not change the validity and reliability of sample since its 16% of the total sample with negligible impacts to the results therefore this article is using 172 filtered results. Researcher chosen the sample basing on demographic, such as age, gender https://www.questionpro.com/blog/gender-survey-questions/questions, or physical location. The goal of figuring out the sample size is to ensure that the sample is big enough to give statistically valid results and accurate estimates of population parameters but small enough to be manageable and cost-effective.

Questionnaires, interviews, observations and focused group discussion were used to collect data about livestock keeping in the mentioned wards. The information gathered was then processed and analysed by using Microsoft Excel and SPSS. Correlation analysis method mostly chi-square was used to see the relationship between livestock keeping and food security.

FINDINGS AND DISCUSSIONS

Population Characteristics of the Wards

This section highlights the respondents' characteristics in terms of gender, farm size, household size, and education level in the wards studied. This is further followed by the critical analysis of the research question as they were set in the introductory chapter. Analysis of the respondents helped to determine the level of participation and involvement of several actors in the performance of urban agriculture, which then portrayed the picture of urban agriculture in the study areas

Table 1: Gender and Age Distribution against Studied Ward in Arusha City

Wards	**Age group**	**Sex**			
		Male	**Female**	**Total**	**Percent**
Sombetini	18-25	3	1	4	2
	26-35	4	14	18	10
	36-45	14	22	36	20
	46+	6	2	8	5
Sokon one	18-25	2	1	3	2
	26-35	9	10	19	11
	36-45	11	16	27	16
	46+	3	0	3	2
Daraja Mbili	18-25	1	2	3	2
	26-35	3	18	21	12
	36-45	9	16	25	15
	46+	5	0	5	3
Total		**70**	**102**	**172**	**100%**

People of all ages and genders participated in urban agriculture. They differ only in the magnitude of involvement and duration of doing it. Based on the findings in the table 1 above, it was found that those who participated much in UA were respondents in the two age groups 26-35 and 36-45. Sombetini ward had percentage of 30 followed up by two wards of which their percentages tied to 27 each respectively. The involvement of people in UA in these age groups might have been forced by responsibilities they had in their families, and thus, UA was seen as simply a supplement to income and food.

Other age groups had minimum involvement in practicing urban livestock keeping as shown in the table. i.e. age 18-25 and 46+. Those at the age group of 18-25 can be attributed to the age of schooling since those who didn't pass the primary school examination to enter secondary schools and their parents are poor are often engaged in urban livestock keeping to support their lives in town areas.

Basing on the gender, females are largely involved in urban livestock keeping. At the age of 26-35 and 36-45 women are 36 while males are 18. This observation tallies with other researchers' observation, although the study by Urassa (2019) in Morogoro municipality revealed the vice versa. He recorded the male to be dominant by 94.6 % over women who are 5.4% In Morogoro Municipality the results show that men have more interest in milk production. In this article the number of women at the age 46+ are very few in comparison with men. The majority of men and women are those who became redundant from white colour jobs and are now practising urban agriculture as traditional work.

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Household characteristics of Arusha (in education level)

We can simply see from the interview done at the study area that, the group of people mostly engaged in urban livestock keeping. Those who ended up in primary and have not gone to school have high percentages of involvement in livestock keeping. Primary level had 28.5 % of the whole sample while those who never attended school had 43.0%. This is about 71.5 % made up by two groups of respondents. The suggestive reason is that, these two groups of respondents are deprived from white colour job; while livestock keeping is a major business which runs their lives.

Those with a higher level of educational like form four; colleges and university are small amount around 28 %. This can also be due to a lack of time in managing the task of livestock keeping or a lack of enough space to practice it.

The study done in Malawi's in two main cities (Lilongwe and Blantyre) revealed two predominant 'types' of urban farmers: (i) low-income, less educated, often female-headed households, who use urban agriculture as an insurance against income losses and who can employ skilled workers to support their livestock activities; and (ii) middle- and high-income, often male-headed households, that undertake urban agriculture for personal consumption (Ehui, 1998)

Therefore, this leads to the conclusion that urban farming is dominated by people who did not go beyond the primary education level and who were deprived of white colour job opportunities hence, the urban survival strategy is mainly by farming and performing petty trade.

Household Size of the Respondents in the Study Wards and its impacts in food demand

With regard to the household size, more than ¾ (88.8%) of the interviewed household had a family member around 8 which is a big number of the family members and this denote the extended family type. The number of households has an impact in the food security. The bigger the household size, the more the food demand. According to the table 2 below, only 3.9 % of the respondents had 2 family members, this group is made up of youth, a number of whom were recently married, followed by a household having 9 members and above which account for 7.2%. This number suggests that food demand per month is higher than in a household having family members below 4 people. The households with large family member always lamented having food shortages in their homes. The table below presents the household sizes of the interviewed population.

Table 2: Proportion of household size in the three wards studied

		Household size					
Wards		**1-2.**	**3-4**	**5-6**	**7-8**	**9+**	**Total**
	Sombetini	4	32	21	26	6	89
		2.6%	21%	13.8%	17%	3.9%	58.3%
	Daraja Mbili	0	3	17	13	0	33
		0%	2%	11.2%	2%	0%	15.2%
	Sokon One	2	12	7	14	5	40
		1.3%	7.9%	4.6%	9.2%	3.3%	26.3%
Total		6	47	45	53	11	172
		3.9%	31.9%	29.6%	28.3%	7.2%	100%

Source: Field data 2023

Types of Livestock Kept in the Study Areas

Based on the findings, the livestock kept in the study areas are depicted by the table 3 below; dairy cows are the most kept animals than others. They are leading by about 39.0 % over other livestock kept in the study wards. Goats have 22% followed by chickens 20.3 %. The other types of livestock and poultry kept they make a total of 18.6% [i.e. duck, doves and sheep)

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Dairy cows are leading due to their nutritional values and economic benefits. They provide milk in which, the majority of people in the surveyed areas run their lives through it. Dairy cows also provide many urban dwellers with nutritional food for both babies and elders. The rest of the animals are kept for luxury, to save when there are small problems of tuition fees, diseases and when the visitors come.

Table: 3 Types of livestock kept in the study area

Livestock	Sombetini	Daraja Mbili	Sokoni One	Percentages
Dairy cows	26	18	23	39.0
Goats	10	15	13	22.1
Sheep	3	2	5	5.8
Ducks	8	6	4	10.5
Chickens	13	16	6	20.3
Doves	1	0	3	2.3
Total	61	57	54	100

Source: Field data 2023

For representation, a few plates are provided to support the case presented. The zero-grazing style of animal keeping is mostly practised because the municipal rules and conditions prohibit free animal keeping in urban areas.

Plate1: Zero grazing in Sombetini ward

Plate 1 above depicts the concrete situation of urban livestock farming.

The respondent possessed more than 15 dairy cow heads (out of the range of 1-5 dairy cows proposed by the by–laws), and the average milk production per single milking period was over 80 litres. Although the respondent had other businesses like vegetable cultivation, he confessed to getting more of his requirements, like food and income from selling milk.

Relationships between Urban Livestock Keeping and Food Security

In order to measure the relationship between urban livestock keeping and food security, the researcher set variables which helped him to clearly show this relationship. As for this study, food security was considered to be the dependent variable, and urban livestock kept the independent variable in testing the relationship chi-square was used, and a summary of the findings is reflected in the table below.

Table 4: Relationship between livestock keeping and food security

Wards		**Is there a relationship between livestock keeping and food security**					
Ward			**Strong agree**	**Agree**	**Neither**	**Not Agree**	**Total**
	Sombetini	Count	29	42	9	10	90
		percent	19.1%	27.6%	5.9%	6.6%	58.6%
	Sokon one	Count	21	19	0	0	40
		percent	13.8%	12.5%	0%	0%	26.3%
	Daraja Mbili	Count	7	12	1	3	23
		percent	4.6%	7.9%	0.7%	2%	15.1%
Total		Count	57	73	10	13	172
		percent	37.5%	47.4%	6.6%	8.6%	100%

Source: Field Data (2023)

For the relationship between livestock keeping and food security, the scale of measuring like 'strongly agree', agree neither nor disagree, and not agree" were used and respondents were asked to tick their correspondence as shown in the table 4 above.

Table 5: Chi-square Showing relationship between livestock keeping and Food Security

	Is there a relationship between livestock keeping and food security?	Wards
Chi-square	77.307	46.355
Df	3	2
Asymp, sig	0.035	0.343

Then, a chi-square statistical measure was used. The results of (chi-square=77, P-Value=0.000) were recorded, showing that there is a strong positive relationship between livestock keeping and food security in the study area.

Milk Production and its Effect on Food Security and distribution

Milk production is one of the major sources of income for the majority of the urban livestock keepers and even rural residents in Arusha city. The incomes they obtain determine the purchasing power of food and provide them with the ability to meet the basic social services.

The respondents interviewed shown that the share of milk produced had significant contribution in food security. Majority of the households had 2 to 5 dairy cows of which each day they sell about 11-20 litres of milk. Through milk selling the household changed their life standard as it saved for house expenditure for each day without intervening their other wages like salary for those who are employed. The highest milk produced per litre per household was recorded to be 41-50 litres for few people who managed to rear 10 dairy cows while the least production is about 5-10 litres. The average milk production per day recorded was about 15 litres. The market was spelling Tsh 1400/=per litre which make Tsh 21,000/= per 15 average litres which significantly saved home affairs with some money remaining unused.

In comparison with other studies done, the average milking per day is a bit small as it read 15 litres. Urassa (2017) indicated the average milk production for each respondent per day was 22 litres which is a bit higher. The low production reported in this article may have been due to a number of factors, including lack of proper feeding of the dairy cattle's, poor nutrition value of pastures and forages offered to the animals and lack of dairy husbandry training, as none of the respondents had received any formal training in dairy cow management.

Also Ehui (1998) concluded that livestock production in urban areas makes easier for household to access high quality animal protein food such as eggs, milk and meat. This in turn improves nutrition and food security and reduces food bills.

Income Generated from Urban Livestock Farming and its contribution in combating food insecurity in Arusha region

In Arusha, milk production plays a crucial role in food security, providing both a source of nutrition and income for local communities. While Arusha benefits from favourable conditions, challenges like inconsistent milk supply and technology adoption hinder milk production. Despite these hurdles, Arusha's dairy sector contributes to food security by directly providing milk for consumption and generating income for farmers to purchase other food items.

The study revealed that small-scale dairy farming and poultry keeping within the study areas contributed much to the welfare of the household and income generation. Chickens selling range from 12,000 to 30,000/=Tsh. Doves are sold for about 2500/= Tsh and ducks are priced for about 20,000/=Tsh to 35,000/=Tsh while Goats and sheep ranges from 100,000/=Tsh to 200,000/=Tsh. For persons with all these varieties of livestock can earn enough income for running his or her life. The profit gained from dairy enterprise and poultry keeping is mainly used on the variety of activities like, education(paying tuition fees) and other life cost such as (food, health services, and etc).

CONCLUSION AND RECOMMENDATION

The article has proved that urban livestock keeping has significant contribution to food security to urban dwellers as more than 50 % of the respondents in the investigated three wards revealed. Livestock keeping by itself changed the life style of people in Arusha and it acted as supplement to household income to many people performed urban livestock keeping. This is backed by many opportunities and benefits one enjoys when engaging in urban livestock keeping, notably food security, healthy eating with fresh food, and recycling of waste products, among others. Notwithstanding the challenges and constraints, which include inadequate inputs, theft of products, high cost of labour and lack of guidance from trained professionals, policy and regulations are threatening the developments of livestock keeping in the city corridors.

The government is consulted to support small livestock keepers in terms of the market of their produce and medical treatment when some diseases attack but also supervising the hygiene of the product since some of the farmers are not well equipped with skills of keeping animals, i.e. they use their traditional styles.

The researcher recommends that: further research should be conducted looking the hygiene and environmental impacts caused by small livestock keepers in the study areas in the current situation.

Livestock is survival strategy to many households whether employed or not non-employed therefore research should also be conducted to boost the production of milk as income generator to Arusha community and in other regions of Tanzania to combat food insecurity.

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