



# **Contribution of Local Chicken Production towards Improving Peoples Wellbeing: A Case of Peri-Urban Areas of Kinondoni District, Tanzania**

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## **Authors' contributions**

*This work was carried out in collaboration between both authors. Author EEC designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author FSS managed the literature searches and wrote the final draft of the manuscript. Both authors read and approved the final manuscript.*

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## **ABSTRACT**

Several studies have been conducted on characterization of local chicken production systems in some places of Tanzania, yet clear information is limited regarding to its contribution towards improving peoples wellbeing particularly its socio-economic importance in the country. This study therefore accessed the socio- economic importance of local chickens' production in peri-urban areas of Kinondoni District, Dar es salaam-Tanzania. A cross sectional research design was employed. The study was conducted in peri-urban areas of Kinondoni District, Dar es Salaam Region involving three peripheral wards namely: Kibamba, Kwembe and Mabwepande, between September and October 2014. Both purposive and random sampling was used. Purposive sampling was used in selecting six streets from which local chickens were kept and random sampling was used in selecting 90 local chicken keepers (15 local chicken keepers per street) from the list provided by livestock extension officer. Data were collected using a household questionnaire survey, Focus Group Discussion (FGDs) and Key Informant interview (KI) methods. Quantitative and qualitative data were analysed using respective methods of data analysis

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(SPSS). The study findings found that, the local chicken contributes to peri-urban household's wellbeing as 92.2% of all the respondents spent some amounts of local chicken earnings to buy food. This shows that local chicken keeping contributes to improving food security at the households of the local chicken keepers. Some households used local chicken for gift giving, rituals and detection of time. Education level, initial capital, experience of local chicken keeping, rearing systems, accessibility to extension services and constraints were significantly influencing production of the local chicken ( $p < 0.05$ ). The researchers conclude that local chicken production improves socio-economies of peri-urban households of Kinondoni District. The study recommends that various stakeholders including the local governments should put more emphasis on promoting local chicken production as it contributes to the smallholder household's socio-economies.

*Keywords: Local chicken; peri-urban; income; Kinondoni; socio-economies; Tanzania.*

## 1. INTRODUCTION

Local chicken (LC) has been increasingly recognized as one of the entry points to address the problems of malnutrition, food insecurity, low income and poverty as a whole. Among all domesticated bird species, local chicken is the largest constituent of poultry population in countries [1]. Local chicken keeping is a profitable venture and eventually a tool for livelihood improvement [2,3,4,5,6]. According to [7], local chicken contributes substantially to family incomes and nutrition. Moreover, rustic chickens have important social and cultural values [8,9].

Local chickens are commonly found in most rural areas in developing countries and seemed to be important for livelihoods of the keepers [10,11,12,13]. Some studies argue that these local chickens have to be predominant in African peri-urban areas, because of their affordability in keeping as opposed to other types of chicken [14,15]. In Tanzania, the total population of poultry is estimated to be 38 967 752 out of which 38 204 764 are local chickens [16] kept in rural and peri-urban areas [17], yet their economic contribution to peri-urban households has not been well established. In addition, there is inadequate information of local chicken to social, economic and cultural values in Tanzania [18].

Despite the high demand for local chicken particularly in urban areas, potential economic importance of local chicken to income and poverty alleviation has not yet been realized. Some studies have been done focusing on peri-urban and urban local chicken keeping in Tanzania and elsewhere in developing countries. Although there are studies conducted, in general, on characterization of local chicken production systems in some places of the country [19,20,13], yet clear information is limited

regarding the socio-economic importance of local chicken in Tanzania.

This study was carried out in Kinondoni District, Dar es Salaam City. Dar es Salaam is one of the major urban centers in Tanzania where local chicken keeping has been expanding due to different reasons [21]. The local scavenging chickens are kept exclusively by low, medium and high income groups, either in peri-urban and urban areas or in low-density and peri-urban settlement areas. The number of local chickens kept depends on family income. Currently, local chicken population in Kinondoni District is projected at 540 000 local chickens [22]. However there has been inadequate information on the contribution of local chicken to socio-economies of the peri-urban households.

Therefore, this study was carried out to fill the gap. Specifically, the paper identified types of local chicken, challenges of keeping local chicken, and source of capital; the paper also examined the contribution of keeping local chicken to socio-economies of households; examined gender relations in keeping local chicken; examined cultural aspects in keeping local chicken and examined factors influencing income through keeping local chicken.

## 2. MATERIALS AND METHODS

This study was conducted in peri-urban areas of Kinondoni District, Dar es Salaam Region, Tanzania. Specifically, three peripheral wards namely: Kibamba, Kwembe and Mabwepande were involved. The wards were selected purposively. The selection of the wards was due to the reason that their major socio-economic activities include local chicken keeping activities. Kinondoni is located in the northern part of Dar es Salaam City in Tanzania. It has an area of 531 km<sup>2</sup>, and experiences a modified type of equatorial climate. In addition, the reason of

conducting this research in the Kinondoni District is that few researches in relation to the local chicken performance in term of socio-economics have been conducted in the district [23].

The targeted population of the study was local chicken producers in six peri-urban streets in Kinondoni District. These actors in the study area were targeted because they were the people with relevant information concerning the problem under study. The sample size from which data were collected was 90 respondents. Therefore, purposive sampling was used to select six streets from which local chickens were kept. The streets are located in such a way that two streets (Kwembekati and Luguruni) were in the Kwembe Ward, and another two (Kiluvya and Mpijimgohe) were from Kibamba Ward, and the last two streets (Mbopo and Mabwepande) were in Mabwepande Ward. On average 15 households were randomly selected from the list of local chicken keepers provided by livestock extension officer in each street, that summing up to a total of 90 households. The respondents selected were as follows: Kwembekati (15), Luguruni (15), Kiluvya (15), Mpijimgohe (15), Mbopo (15) and Mabwepande (15) making a total of 90 respondents for the study.

Both primary and secondary data were collected. For primary data, three methods namely household questionnaire survey, Key Informant interview (KI) and Focus Group Discussions

(FGDs) were used. Primary data were collected using a structured questionnaire. However, secondary data were collected in order to supplement the information that was collected from respondents. From this, the data collected included, but were not limited to, the socio-economic and cultural contributions of income earned from local chicken sales to the household's wellbeing, social cohesion and networks.

Data were analyzed using both quantitative and qualitative methods. Quantitative data were analyzed using the Statistical Package for Social Sciences (SPSS) software and involved preparation of the variables so as to suit the research questions and the method of analysis used and reported data from responses. Descriptive and inferential statistics were applied to determine whether the patterns described from the sample were likely to apply in the population where the sample was drawn [24]. A binary logistic regression model was used. The model was as follows:

$$\text{Logit}(Y_{ik}) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + e_i.$$

The variables from Y and X<sub>1</sub> to X<sub>k</sub> are shown in Table 1. Qualitative data were analysed using content analysis methods. The method was used mainly for data collected from FGDs observation and key informant interviews. The meaningful information collected through FGD and key

**Table 1. Variables used in the multiple linear regression model**

Variables inserted in model	Variables	Measurement
Y	Increase of local chicken keeping	Yes = 1; No = 0
X <sub>1</sub>	Sex of respondents	Male = 1; female = 2
X <sub>2</sub>	Age of respondents	Number of years
X <sub>3</sub>	Education of respondents	Number of years in schooling
X <sub>4</sub>	Marital status of respondent	Single = 1; married = 2; divorce = 3; widow = 4
X <sub>5</sub>	Main occupation of respondent	Farmer = 1; civil servant = 2; self-employed = 3
X <sub>6</sub>	Capital	Amount in Tshs
X <sub>7</sub>	Duration of keeping local chicken	Number of years
X <sub>8</sub>	Types of rearing of rearing systems	Free range = 1; Indoor = 2; Semi-indoor = 3
X <sub>9</sub>	Types of labour used in keeping chicken	Family = 1; hired = 2
X <sub>10</sub>	Owner of the local chicken	Women = 1; men = 2; both = 3
X <sub>11</sub>	Accessibility to extension services in terms of veterinary services	Yes = 1; no = 0
X <sub>12</sub>	Constraints facing the local chicken keepers	Diseases = 1; predators = 2; theft = 3; unreliable market = 4; lack of access to credits and inputs = 5

informant interview were summarised and reported.

### 3. RESULTS AND DISCUSSION

#### 3.1 Local Chicken Keeping and Related Activities

The study area was characterized with four different local chicken types: 88.9% were Bukini; 6.6% were Kishingo, 3.3% were Kuchi and the remaining 1.1% was Kinyavu (Table 2). From the table, Bukini has been kept by many peri-urban households. The reason for keeping Bukin species was due to being good mothers and resistance to diseases [25]. The common rearing systems used in the study area for chicks and chicken are also shown in Table 2. Out of the 90 farmers, 62.2% practised free range system, while 22.2% used semi-intensive, and the remaining (15.6%) practised indoor system. This study shows that majority of respondents used free range production system. This is also observed by [26] that free range system in keeping local chicken needs low input. This is why many farmers prefer the system to others. However, the free range system has some implications such as theft, diseases and undernourished.

The findings in Table 2 show that 70% of the farmers reported that local chickens had their special shelters and houses, while 7.8% used the same houses with human beings with the reason of protecting them against thieves as a major problem. The remaining 22.2% of the farmers reported that their local chickens slept in the kitchens. During the survey it was observed that most of the houses used for local chickens were made of mud bricks, wood, and few were made

of cement bricks. In the local chicken shelters, there were no laying boxes and a special place for chicks rearing. During FGD, it was revealed that the high cost of constructing a standard local chicken shelter or house had made farmers to construct sub-standard local chicken shelters.

The results show that Newcastle disease contributed to 86.7% of deaths, followed by fowl pox disease which contributed to about 10% for both chickens and chicks (Table 3). The economic benefits resulting from LC contribute to the rise of livestock sector and of national economy, but one of the costly exercises that farmers are trying to avoid in the study area is failure to use industrial veterinary drugs, like vaccines, antihelmintics and alike.

During focus group discussions (FGD), some of the farmers reported to have stopped vaccinating their chickens due to the presence of fake veterinary drugs in the market, because they have been vaccinating against Newcastle and fowl pox and the same diseases outbreak occurred and affected their flocks. Newcastle disease (ND) has been reported to be the main cause of chickens and chicks loss in various areas in Africa [27,28,29]. The reason for high existence of Newcastle disease is to the facts that, many smallholder farmers cannot afford to purchase and store the ND vaccine. The vaccine is expensive and required to be stored in the refrigerator of which the most of the smallholder farmers cannot afford. Additionally during FGDs and KI interview in the study area, it was revealed that ND eye drop vaccine which is affordable and can be kept under room temperature was not effective in prevention of chickens against Newcastle disease.

**Table 2. The types of local chicken (LC) kept and rearing systems (n=90)**

Types	Frequency	Percentage (%)
<b>Types</b>		
<i>Bukini</i>	80	88.9
<i>Kishingo</i> (Naked neck)	6	6.6
<i>Kuchi</i>	3	3.3
<i>Kinyavu</i> (frizzled feathers)	1	1.1
<b>Rearing systems</b>		
Free range	56	62.2
Semi-intensive	20	22.2
Indoor	14	15.6
<b>Shelters</b>		
Special house/shelter	63	70.0
In the kitchen	20	22.2
Same house with human being	7	7.8

The results in Table 3 show that 88.9% of the respondents used modern drugs, while only 11.1% of the respondents used traditional herbs. This was also said during the FGDs that most of herbs were *Aloe vera*, *Solanum incunam*, *Moringa oleifera*, *Jatropha curcas*, neem tree leaves or Indian lilac (*Azadirachta indica*) and small hot pepper in controlling and treating various local chicken diseases. They said further that, the traditional herbs were easily available and not expensive. In a survey of ethno medicinal practices among free range chicken farmers in central and Eastern Uganda, about 80% of the farmers used medicinal plants as alternative remedies for LC diseases [30].

**Table 3. The common diseases, treatment options and other problems affecting chicken (n=90)**

Problem affecting LC	Frequency	Percentage (%)
<b>Diseases</b>		
Newcastle disease	78	86.7
Fowl pox disease	9	10.0
Presence of predators	2	2.2
Worm infestation	1	1.1
<b>Healing purposes</b>		
Yes= (used traditional herbs)	10	11.1
No= (used modern drugs)	80	88.9

The results in Table 4 revealed that there were six different sources of capital and 38.9% of all the 90 LC keepers had the highest source of capital because they performed farming activities together with other businesses such as food vendors, tailoring, carpentry, masonry and 5.6% had attained the lowest source of capital because they were only depending on livestock sales as their source of capital.

The findings in (Table 4) indicate that there are variations in the initial costs used by farmers to start keeping local chicken based on the main sources of capital. During FGDs, Key informant interviews and physical observation, it was found that the high variation in sources of initial capital led to the farmers constructing low or poor standard local chicken shelters with no roofing, laying boxes and a special place for chicks rearing. The majority of the farmers had initial

cost of 56 000 – 106 000 Tsh. (33.3%), while 30% had 107 000 – 157 000 Tsh. and only 7.8% had above 157 000 Tsh. This shows that majority had initial capital below 157 000 Tsh. Generally, the findings show that most of chicken keepers had low initial capital for the enterprise. This was also revealed during the FGDs and KIs that the participants mentioned that they had difficulties in getting the capital for starting local chicken enterprise.

### 3.2 Contribution of Local Chicken to Socio-economies of Households

The study shows that, local chickens contributed to income of households at range of Tsh. 10 000 to Tsh. 12 000 000 (Table 5). A plausible explanation for the high range is probably very few farmers gained and made high profit than the majority. Despite, the local chicken (LC) have a good market in the city of Dar es Salaam. For the majority, the sale of local chickens takes place only when there are household critical needs or problems. Most of respondents kept local chicken for domestic consumption rather than for commercial purposes. The findings in Table 5 indicated that, income from sales of LC and eggs is used for paying school fees, paying for health services, buying food and domestic utensil and other basic requirements.

About 50% of both males and females owned local chickens, followed by 37% of female owned LCs, while male only accounted for 13% of those who owned local chickens (Table 6). This reflects the real situation in most of the peri-urban areas in Tanzania that the majority of the women own and care for local chickens. The plausible reason is that women consider local chickens as a family bank and bio asset as a source of income, social capital asset and nutrition [31].

Men have control over large animals which enable them to acquire and reproduce their power at the households. As [32] pointed out that women are more involved in local chicken production than men, this had made the farmers to develop superior caring techniques as opposed to the latter. The superiority is probably due to the reason that women spend more time at home caring for local chickens than men; besides LC activities do not require masculinity.

**Table 4. Source of capital (n=90)**

Sources	Frequency	Percentage (%)
From other businesses (e.g. food vendors, masonry, carpentry, tailors)	35	38.9
From crop sales	16	17.8
From salary	13	14.4
From crop & livestock sales	13	14.4
From remittance	8	8.9
From livestock sales	5	5.6
Initial costs (Tsh.)		
5 000 – 55 000	26	28.9
56 000 – 106 000	30	33.3
107 000 – 157 000	27	30.0
>157 000	7	7.8
<i>Minimum =8000; Maximum = 850 000; Mean = 122 922 ± 140 532 (1US\$ = 2180)</i>		

**Table 5. Income/Earnings from selling local chicken per year (n = 90)**

Income in Tsh.	Frequency	Percentage
< 50 000	12	13.3
51 000-100 000	24	26.7
>101 000	54	60.0
Minimum= 10 000, Maximum =12 000 000, Mean = 1 831 591 ± 2 146 869		
Utilization of income		
Items	Frequency	Percentage
Paying school bills	67	74.4
Paying health services	49	54.4
Buying food	38	42.2
Buying domestic utensils	26	28.9
Buying motorbike	4	4.4
Paying water and electric bills	27	30.0
Paying house rent bills	21	23.3
Other basic requirements	15	16.7

During FGDs, participants revealed that women were the ones who owned and took care of the local chickens, but during selling they had to discuss the matter with their spouses. It was noted, as seen in Table 6, that 36.7% of female and 13.3% of male had decision making power over the selling of local chickens and eggs, as compared to 50% of decisions which were made by both male and female in selling local chickens and eggs (Table 6). This finding can be interpreted that ownership of the chicken determines the power of making decision over the chicken especially during selling them.

This partly gives the impression that although women are responsible for ownership and caring for local chickens in the household, they are not the last decision makers on either to sell or not to sell the local chickens. A similar study was done in Mozambique and found that women were having a very little say in the selling of local chickens; instead men were the ones with the

decision on whether to or not to sell the local chickens. Generally if local chickens were under control of women, they had some mandate or autonomy in their use [33].

The findings of the study indicate that at the household level, adult females were the ones who spent more time to take care of local chicken (50%) compared to adult males who spent little time (7.8%), while girls and boys accounted for 4.4% and 1.1% respectively (Table 6). This shows women most often involve in taking care of local chicken. The possible reason, they have control and decision making power over the chickens.

The findings indicated that income obtained from selling local chickens was used to purchase food for household use. It was found that 92.2% of all the respondents spent some amounts of local chicken earnings to buy food (Table 7). The study revealed that majority of farmers involved

in LC keeping (91.1%) had the ability of getting three meals per day (Table 7). This shows that local chicken keeping contributes to improving food security at the households of the LC keepers.

**Table 6. Ownership and decision making on LC by Gender in the Households (n=90)**

<b>Ownership</b>	<b>Frequency</b>	<b>Percentage</b>
Both male and female	45	50.0
Female	33	36.7
Male	12	13.3
<b>Decision making</b>		
Both male and female	45	50.0
Male	12	13.3
Female	33	36.7
<b>Caring</b>		
<b>Activity</b>	<b>Frequency</b>	<b>Percentage</b>
Only female	45	50.0
Both male and female	33	36.7
Only male	7	7.8
Female children (Girls)	4	4.4
Male children (Boys)	1	1.1

**Table 2. Expenditure from local chicken earnings for HH food (n=90)**

<b>Expenditure</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Expenditure for food</b>		
Yes	83	92.2
No	7	7.8
<b>Number of meals per day</b>		
One meal	1	1.1
Two meals	7	7.8
Three meals	82	91.1

Social-cultural aspects for keeping local chickens are ranked in a descending order of preference from 1 to 4 as shown in Table 8. Findings of this study indicated that all households (100%) consumed chicken meat and eggs from chickens (Table 8). Local chickens provide meat and eggs as food for home consumption as well as for special festivals like religious celebrations, for example Easter, Christmas and Eid al-fitr [3]. Household is both the producer and the consumer of most of its produces in case of subsistence farmers. This implies that chicken and its products are among the household foodstuff eaten for nourishing household members in the study area.

Local chickens are among the livestock which have multiple uses apart from nutritional uses and income generation. Some respondents used chickens in various ways such as to honour guests as well as offering them to relatives as a gift (95.5%), ritual sacrifice and traditional healing (33.3%) Table 8. The findings presented in here are similar to [34] who reported that local chickens are used socio-culturally for mystical functions such as hospitality and exchange of gifts to strengthen social relations.

Before inventing wall clocks and cell phones, some respondents (86.7%) used cocks as alarm clocks to detect time (Table 8). [35] observed that cocks are used for detecting time, especially at the mid-day and at night. Findings in this study indicated that, cock's alarm is still useful to date in spite of having modern technologies of time detection like cell phones and watch alarms. However people in the peri-urban areas are still using cock's alarm especially at night.

Due to decades of colonialism, cultural imperialism and the power of multi-national pharmaceutical industries, traditional healers and traditional medicines have been marginalized, and their value to communities underplayed [36, 37]. This study revealed that, for socio-cultural aspects, local chickens are used by traditional healers to provide healing services to their customers in terms of medicines, sacrifices and witch-craft practices (33.3%) (Table 8).

### 3.3 Factors Influencing Income through Local Chicken Keeping

Table 9 indicates that some variables such as education level, income through local chicken, initial capital, experience on keeping the local chicken, type of rearing systems, accessibility to extension services and constraints showed to be significantly ( $p < .05$ ) influenced local chicken keeping among households (Table 9).

Based on the given findings, one would have given various reasons. Possible reasons may be as high education level facilitates the farmer to have an access to various necessary information and technologies on local chicken keeping based on production activities and veterinarian services as opposed to those who do not have any kind of formal education. This was also observed by [38] and [39] that, education is very important for personal development.

**Table 8. Socio-cultural aspect for keeping LC (n=90)**

Aspects	Number	Percentage (%)	Rank
For home consumption	90	100.0	1
Honour guest, gifts to relatives and friends	86	95.5	2
For time detection(cock's alarm)	78	86.7	3
Use for healing/ritual purposes	30	33.3	4

**Table 9. Regression model results showing factors influencing income from local chickens**

Variable	Unstandardized B	Std error	Standardized B	T	Sig.
(Constant)	-1.088Exp6	4.111Exp6		4-.265	.002
Sex	185 613.338	691 099.368	.041	.269	.789
Age	-13 152.539	28 821.308	-.075	-.456	.650
Education level	131 240.615	128 195.925	.184	3.024	.011
Marital status	322 259.305	417 533.676	.118	.772	.444
Main occupation	515 919.950	371 746.370	.219	1.388	.171
Initial capital	3.528	2.394	.217	2.473	.047
Experience on keeping local chicken	-16 616.149	41 206.466	.057	3.403	.006
Types of rearing systems	-92 299.296	343 871.406	.042	2.268	.007
Types of labour used in keeping chicken	362 405.827	2.327E6	.021	.156	.877
Ownership of the local chicken	232 681.587	343 046.031	.098	.678	.501
Accessibility to extension services	-526 066.152	696 949.344	-.109	1.755	.045
Constraints facing the local chicken keeping	69 858.964	106 632.797	.093	1.655	.005

On the other hand, initial capital for chicken keeping showed to be very important as it determines rearing system, acquisitions of veterinary services and inputs. Rearing systems, access to extension services and input as well as constraints influence productivity of local chickens elsewhere [40,41]. For example, if the rearing system is free range the chickens have more risk to be attacked by predators than those kept in indoor system. This revealed in this study that majority of the farmers practiced free range system. It was also said by the farmers during FGDs and KI interview that they had constraints such as lack of extension services, diseases, theft, unreliable market and predators. From the findings, there is a view that local chicken keeping and productions are influenced by many factors. However, the major ones are initial capital and income gained from the production.

#### 4. CONCLUSION

Based on the findings of the study, it is concluded that, generally local chickens could help peri-urban households improve their socio-

economies. Local chicken seemed to have been offering an opportunity for peri-urban households to earn income from selling chickens and its products, which extended their income. Through local chicken production, smallholder households gain additional financial capabilities enabling them to pay for children's school fees, food, health services, housing utility bills and acquisition of assets. However, local chicken keeping faces various problems such as predators, extension services and diseases, which hinder its production. In order to improve local chicken production in peri-urban areas as well as rural areas, efforts should be made on facilitation of financial sources such as loans/credits, market, extension services and vaccination and availability of drugs. In addition, stakeholders of livestock, should have interests in improving local chickens as they contribute to livelihood outcomes of farmers.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.



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