

**SOCIO-ECONOMIC IMPORTANCE OF LOCAL CHICKEN PRODUCTION IN
PERI-URBAN AREAS OF KINONDONI DISTRICT, TANZANIA**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
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ABSTRACT

Local Chicken (LC) keeping is an important activity in improving socio-economics of the peri-urban communities in Tanzania. Despite the LC has socio-economic importance, its information is in adequately available. This study assessed the socio- economic importance of LCs production in peri-urban areas of Kinondoni District. The study specifically determined the contribution of local chicken production to peri-urban household's income, examined the process of LC management from day old chick to the market time, examined constraints facing LC keeping and determined factors influencing income through LC keeping. The study employed a cross-sectional research design and a purposive sampling technique was used to select a sample of 90 households which were keeping LCs. Primary data were collected using a household questionnaire survey, Focus Group Discussion (FGDs) and Key Informant interview (KI) methods. The data from the questionnaire were analysed using Statistical Package for Social Science (SPSS). Descriptive statistics namely frequencies, percentage and mean were computed. A multiple linear regression was used to determine contribution of local chicken to household income. The data collected using (FGD) and (KI) were analysed using content analysis method. The study findings found that, peri-urban households earned a good amount of income from sales of LC and its products. LC income supported on HH to afford some basic needs such as school fees, food and health services bills. Both females and males jointly owned LC at 50%, female owned LC for about 37% while males accounted for 13.3%. About 96% of households used LC as a gift and ritual sacrifice while traditional healings accounted for 33.3%. About 37% of HHs reported to use cock's alarm for detecting time. Education level, initial capital, experience of LC keeping, rearing systems, accessibility to extension services and constraints were significantly influencing income and production of the local chicken ($p<0.05$). The study concludes that local

chicken production improves socio-economies of peri-urban households. The study recommends that various stakeholders including the local governments should put more emphasis on promoting LC production as it contributes to the smallholder household's income.

DECLARATION

I, Mayalla Steven Bukwelles, do hereby declare to the Senate of Sokoine University of Agriculture(SUA) that, this dissertation is my own original work done within the period of registration and has neither been submitted nor being concurrently submitted for degree award in any other institution.

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The above declaration is confirmed

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Date

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LIST OF ABBREVIATIONS

AC	African Chicken
BC	Before Christ
CBOs	Community Based Organizations
DALDO	District Agriculture and Livestock Development Office
FAO	Food and Agriculture Organization of the United Nations
FBO	Faith Based Organizations
FGD	Focus Group Discussion
FPD	Fowl Pox Disease
ICRISAT	International Crops Research Institute
IFAP	International Food and Agriculture Programme
IGAs	Income Generating Activities
ILO	International Labour Organization
IPP	Indigenous Poultry Production
KI	Key Informant
KMC	Kinondoni Municipal Council
LC	Local Chicken
LGA	Local Government Authority
MARNDR	<i>Ministère de l'Agriculture, des Ressources Naturelles et du Développement Rural</i> (Ministry for Agriculture, Natural Resources and Rural Development)
MLD	Ministry of Livestock Development
MLDF	Ministry of Livestock Development and Fisheries
MLGRA	Ministry of Local Government and Regional Administration

MOAFS	Ministry of Agriculture and Food Security
MSc	Master of Science
ND	Newcastle Disease
NGOs	Non-Government Organizations
NLP	National Livestock Policy
NPHC	National Population and Housing Census
NSCA	National Census of Agriculture
NSGPR	National Strategies for Growth and Poverty Reduction
PhD	Doctor of Philosophy Degree
RDP	Rural Development Policy
RIU	Research Into Use
RLDC	Rural Livelihood Development Company
RUAF	Resource centres on Urban Agriculture and Food security
SIC	Scavenging Indigenous Chicken
SNAL	Sokoine National Agriculture Library
SPSS	Statistical Package for Social Sciences
TDV	Tanzania Development Vision
TFDA	Tanzania Food and Drug Authority
TSCA	Tanzania Sample Census of Agriculture
TZS	Tanzanian Shillings
UNDP	United Nations Development Programmes
URT	United Republic of Tanzania

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

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. Local chickens are distributed everywhere in the tropical countries (Mengesha, 2012). The traditional LC production in Tanzania and other African countries are mainly based on scavenging LCs found in almost all households in the peri-urban areas

Local chicken variety keeping is a profitable venture and eventually a tool for livelihood improvement and poverty alleviation (Gawande *et al.*, 2007, Dolberg, 2007; Fasina *et al.*, 2007; Sharma, 2007; Dei *et al.*, 2009). According to (Sonaiya, 2007), local chicken contributes substantially to peri-urban family incomes. This activity empowers women financially and improves the educational and nutritional status of children through the gained income and the intake of chicken and eggs. Moreover, rustic chickens have important economic and cultural values (MARNDR, 2007; Laroche and Awono, 2008). Local chickens are commonly found in most peri-urban areas in developing countries. The initial and running costs of rearing local chickens are generally low thus affordable by low income earners. In Kenya, local chickens constitute 76% of all poultry kept in peri-urban areas (Kingori *et al.*, 2010) while in Nigeria for instance, 80% of the 120 million poultry are local chicken (Adedeji *et al.*, 2006; Yakubu *et al.*, 2008). Studies in Ethiopia (Moges *et al.*, 2010) have shown that smallholder farmers retain about 45% of local chicken eggs laid for natural incubation. This sub-sector is very important for the livelihood and food

security of most developing nations as it is mainly raised by the majority of the peri-urban households (Lwelamira *et al.*, 2008). It is the major source of readily available protein in the form of eggs and meat as well as being a reliable source of income of peri-urban households. Generally, they are used to meet multiple social, economic and cultural needs of many households. Local chickens or indigenous chicken types manifest good adaptation to tropical climatic conditions as well as resistance to diseases.

These local chickens remain predominant in African peri-urban areas despite the introduction of exotic and crossbred types, because farmers have not been able to afford the high input requirement of the introduced exotic and crossbreeds. Supporting data in the literature have been provided among other countries, including Burkina Faso (Bourzat and Saunders, 1990), the Niger (Abdou and Kolstad, 1992); Uganda (Mukiibi-MukaKirunda, 2000) and the United Republic of Tanzania (Yongolo, 1996).

For example, Uganda has a big reservoir of local poultry genetics, whereby out of the estimated 23.5 million chickens, 84.2% are free-range indigenous chicken breed types. Several scholars have cited the importance and uses of local chicken genetics that include nutrition, cultural and socio-economic benefits (e.g. Ssewanyana *et al.*, 2008). In Uganda, local chicken is an important animal resource in most of peri-urban areas. They are easy to acquire and, under improved management, their reproduction and production are high enough to realize faster income generation due to the minimal initial investment costs. In peri-urban communities, local chickens contribute significantly to the livelihoods of farmers (Kirunda *et al.*, 2003).

Income poverty has been increasing among peri-urban households worldwide, as a result peri-urban households represent 70% of the world's poor (IFAD, 1998). Income poverty is threatening Tanzania's development efforts of empowering peri-urban households economically, since evidence show that income poverty is circumscribed in peri-urban than in urban areas due to unequal distribution of resources and income gained among households (URT, 2007).

In Tanzania, the total population of poultry is estimated to be 38 967 752 out of which 38 204 764 were local chickens (Moreki and Chiripasi, 2011). Majority are kept in peri-urban areas (MLD, 2009), yet their economic contribution to peri-urban households has not been well established. In addition, there is inadequate recent information of local chicken to social, economic and cultural values in Tanzania (Yongolo, 1996).

Local chicken development plays a crucial role in increasing eggs and chicken meat production, also provides an income and employment to a large number of people in rural as well as in peri-urban areas. Local chicken production can act as an engine for economic growth through eradication of peri-urban poverty. The local chicken contributes a lot to the overall production of eggs and chicken meat (Ssewanyana *et al.*, 2008) remarked that economic evaluation of local chickens at household and national levels is complicated and is even more difficult than other livestock because of lack of reliable data. Urban Livestock (UL) is a global phenomenon that involves the raising of livestock (cattle, chickens, goats, and pigs) In Tanzania, (UL) mainly involves the rearing of animals (dairy cattle, chickens, dairy goats, ducks and pigs) in peri-urban and urban areas (Shimbe, 2008).

(UL) is practiced in varying degrees both in developing countries. Study by the United Nations Development Programme (UNDP) (RUAF, 2007) indicates that 80 million peri-urban and urban residents worldwide are engaged in UL and this number is likely to

increase in the near future. In Tanzania, UL has expanded enormously over the past two decades particularly as a coping strategy during economic crises (Mlozi, 1996; Stevenson *et al.*, 1994).

Food security is reported as the main motivation for engaging in UL keeping and for some is adopted as a survival strategy (Sawio, 1993). As pointed out earlier, raising of poultry such as local chickens, broilers, layers and ducks, as part of UL has been expanding in towns and cities in Tanzania (Mlozi *et al.*, 2005). The study was carried out in Dar es Salaam city at Kinondoni District. Dar es Salaam is one of the major urban centers in Tanzania where local chicken keeping has been expanding due to different reasons (Fuller, 2003). 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 (MoAFS, 2009). However there has been inadequate information on the contribution of local chicken to socio-economies of the peri-urban households. Therefore, this study is concerned with peri-urban local chicken keeping in Tanzania and its socio-economic effects.

1.2 Problem Statement

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 by researchers (Tadelle, 1996; Alemu and Tadelle, 1997; Aberra, 2000; Solomon,

2004; Mbarubukeye and Nyiransengimana, 2005; Moges *et al.*, 2010), yet clear information is limited regarding the socio-economic importance, common constraints, production and management of local chicken in Tanzania. Therefore Kinondoni District Council was used as a case study in establishing the socio-economic importance of these local chickens to the household livelihoods.

Peri-urban households in Kinondoni District are constrained by incidence of increased income poverty based on the high inequality observed between the urban and peri-urban households in accessing resources. Additionally there are substantial differences between the average income of men and women with the former earning 1.5 times what later earning (URT, 2007). On the other hand, households in the peri-urban areas are striving to overcome the burden of increased income poverty by engaging in different productive activities including small scale chicken production (URT, 2007). A study by (Gueye, 2009) on the contribution of local chicken on women poverty alleviation found that, local chicken production is an equally valuable asset to other income generating activities (IGAs) such as dairy goats and cattle keeping for the local populations since chicken contribute significantly to food security and poverty alleviation.

Due to the need for reducing income poverty among households, local chicken keeping could be an important reliable source of income for the resource poor and disadvantaged groups of people in the study area. Hence, assessment of local chicken contribution to the peri-urban households' income was thought to be important for increasing local chicken production, increased income and reduction of income poverty among the households.

Despite the support given by the Kinondoni District council to the peri-urban households keeping LC with availability of cheap technology of production through extension workers, still peri-urban households are suffering under income poverty. This study

therefore intended to examine contribution of income from LC to the household level among peri-urban households, and how LC enterprise can be sustainably produced for household income poverty reduction.

1.3 Justification of the Study

Local chickens are more preferred worldwide due to their importance socially and economically. As (Byarugaba, 2007) assessed local chicken is an important source of income for peri-urban poor community due to inadequate access to formal employment opportunities and due to crisis in national economies. LC production is among important income generating activities in the peri-urban settings. Generally, LC serves as a sustainable source of food to households and an income generating enterprise among peri-urban households in Tanzania (URT, 2011). Similarly, the KDC had been emphasizing on LC keeping enterprise among peri-urban households, in order to help improve livelihoods among families in KDC. The findings of national censuses, household surveys and research projects suggest that up to two-thirds of peri-urban and urban households in developing countries are involved in local chicken production (URT, 2009).

Local chicken industry plays an important role in the economy of Kinondoni District for creating employment opportunities for both peri-urban and urban dwellers. It also contributes to sustainable food safety and income generation to poor farmers of the district. Dar es Salaam region has been pointed out by (Rwongezibiwa, 2006) that, 63.3% of chicken consumers prefer local chicken to other types of chicken. Consequently, eggs and meat from local breeds are sold at a premium price.

However, the socio-economic importance of local chicken is inadequately documented, despite good National Livestock policies that emphasize increasing production and quality

improvement of local chicken products to satisfy domestic and export demand (URT, 2006).

The local chicken production sector has apparently been neglected despite this importance there are limited efforts made by the government, private sectors and farmers to improve production and marketing through shared information and coordination among actors along the local chickens. This study is in line with the National Strategy for Growth and Reduction of Poverty (NSGRP), the National Livestock Policy (NLP) of 2006, Tanzania Development Vision (TDV) 2025 and Rural Development Policy (RDP) 2003, all of which emphasize the need for increasing household income and nutritional status of people as a pre-requisite for development and poverty reduction in Tanzania (URT, 2002; URT, 2003; URT, 2006).

The information obtained from this research will be used by different stakeholders including policy makers, academicians, development partners, Local Government Authorities (LGAs) and Non-Government Organizations (NGOs). The findings from this study are also expected to widen the understanding of LC keepers on the economic importance of local chicken production to household income and food security.

In addition, the information obtained from this study will also lay down a tool for empowering peri-urban households through improving access and control of resources, giving credit, inform authorities on factors that hinder successful implementation of initiatives and provide capacity building for effective income poverty reduction among peri-urban households involved in LC production. Therefore the study aimed at examining the socio-economic contribution of local chicken production of peri-urban communities

which would contribute to the knowledge and provide information for use by the government and private actors in effort to promote the LC sub-sector.

1.4 Objectives of the Study

1.4.1 General objectives

The overall objective of this study was to examine the socio-economic importance of local chicken production in smallholder households.

1.4.2 Specific objectives

The specific objectives of the study were to:

- i. Examine local chicken keeping management practices in peri-urban areas of Kinondoni District;
- ii. Examine contribution of local chicken production income to socio-economies among peri-urban households;
- iii. Determine constraints hindering local chicken keeping in Kinondoni District and;
- iv. Determine factors influencing income from local chicken keeping.

1.5 Research Questions

The study was guided by the following research questions:

- i. What are activities involved in local chicken keeping?
- ii. What is the contribution of local chicken production to household's income?
- iii. What are the constraints hindering local chicken production?
- iv. What are suggestions put forward by farmers in solving the constraints facing local chicken production?
- v. What are the factors influencing income from local chicken keeping?

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Description of Various Terms in Indigenous Poultry Production

Local chickens (family chicken, indigenous chicken, and native chicken) are also known as village chicken. The local chicken refers to the chicken whose production is feasible at village level where only low cost technology is needed to improve production considerably, and thus require low investments in terms of feeding and feeds, housing, and land (Mack *et al.*, 2005). According to (Gabanakgosi *et al.*, 2013), local chicken is defined as a small scale poultry keeping by household using family labour and local available feed resources. Thus local chicken can be of utmost economic importance in food insecurity and poverty alleviation as the poorest households.

The terms “indigenous, native or local chickens” are often used as synonymy to family chickens (ibid) and (Moreki, 2006), family chickens are also known as “scavenging local chicken which are the chicken that are allowed to run free in the surrounding and thus also called as “backyard chickens”. Family chickens comprise the major part of the poultry industry in many developing countries where poultry production has been a traditional component of small farms (Moreki, 2006). Local chicken production is considered to be major to other agricultural income generation activities (IGAs) by smallholder farmers; LC production makes an important contribution to supplying local populations with additional income and source of high quality protein from eggs and meat.

2.2 Origin of Local Chicken Poultry

The progenitor of the local fowl is generally considered to be the Red Jungle Fowl (*Gallus ferrugineus* or *bankiva*), though there are three other wild species, all oriental. This species is a native of India, a part of China, the adjacent islands and the Philippines (FAO, 1998;

Dalby, 2003; Anonymous, 2007). Its habitats are diverse, as it can be found in lofty forests and in the dense thickets, as well as in bamboo jungles and on when cultivated lands. This wild species closely resembles the breed of poultry fanciers, the *Black-breasted Game*, but the crow of the wild cock is not as loud or prolonged as that of the tamed one (MacDonald and Blench, 2000).

In Africa, chickens were first discovered in Egypt, where they were reared as foreign pets and game cocks. However, in the year 650BC they became common and economically important. They then spread from there to Sub-Saharan Africa during the first millennium AD (Dalby, 2003). Characteristics such as naked neck, frizzled feathers and also single, pea, rose and walnut combs were common within flocks of local birds (Anonymous, 2007). The naked neck mutation originated in Transylvania, Romania and spread across Europe centuries ago; and the frizzle feathered chicken was first described by Western explorers in Fiji during the seventeenth century (FAO, 2000). These naked neck and frizzle birds were introduced to Africa and the rest of the world by sailors and traders. Local chickens of today resulted from centuries of cross-breeding with exotic breeds and random breeding within flocks of local birds. As a result, it is not possible to standardize the characteristics and performance of indigenous chickens (FAO, 2000).

The indigenous fowls have been variously referred to as the African chicken, local chicken, native chicken, family poultry, village chicken, bush chicken or runner chicken; however, distinct local varieties have been reported in Egypt, Cameroon, Burkina Faso, Morocco and Sudan (Guèye, 1998).

2.2.1 Potential of local chicken

More than 70% of the family poultry population in Africa is made up of the indigenous chicken types kept in low-input, low-output production systems (Kitalyi, 1998). Family

poultry is well integrated into most village farming systems, producing 40 to 70% of the national meat and egg supply in most tropical countries (Horst, 1988; FAO, 2000). Indigenous chickens possess unique adaptive traits that permit them to survive and reproduce under harsh climatic, nutritional and management conditions typically associated with low input–output production systems (Mwamcharo *et al.*, 2007). Local birds are kept by rural smallholders, peri-urban, landless farmers and industrial labourers, because of their scavenging adaptability, production ability and low maintenance cost (Kitalyi, 1998).

Local birds are adapted for survival under scavenging free-range conditions due to their evolution from the same conditions. However, there is still a considerable and largely unexploited potential for increased production from local birds through improved management (FAO, 2000). According to (Horst; 1988) products from local poultry stocks are widely preferred because of pigmentation, leanness, and availability for special dishes. He observed that despite the important role played by local poultry, there is a paucity of information on its genetic make-up with respect to performance, its comparative evaluation with imported lines under similar management conditions and its adaptability and resistance to local diseases.

Local chickens are beneficial to peri-urban people because they are available, adaptable, inexpensive to keep, and have tasty meat and eggs. Improving the genetic potential of local birds will result in faster multiplication of birds, increase in body weight, and improved egg weight and taste. It will also result in more eggs for hatching, sale and consumption, and more income (Mburu and Ondwasi, 2005). Adaptability of local chickens to unfavourable conditions is usually high (Mukherjee, 1990).

2.2.2 Feeding management

Chickens need enough feed to grow and lay eggs. They find their own feed if allowed moving freely; but extra feed should be given in the form of kitchen leftovers including fruit and vegetable waste, cereal grains and by-products, green leaves, fish meal, tubers and roots, insects, termites and worms, and brewers waste. Provision of adequate clean water and feeding of chicken in a clean dry place must be ensured (Mburu and Ondwasi, 2005).

The growth potential of local chickens is not fully exploited under free-range (scavenging) conditions due to inadequate feed supply. Feeding management contributes about 30% of their growth potential (Gondwe and Wollny, 2005). They concluded that, growth of local chickens can be enhanced through improved management under free-ranging conditions.

2.3 The Status of Chicken Production Sector in Tanzania

Chickens play an important role in the livelihood of peri-urban areas in developing countries. Local chicken accounts for about 80% of the world's poultry population in many developing countries (Akinola and Essien, 2011). The rearing of local chicken is an integral part of the smallholder farming system in the tropics, where they are kept by the rural and peri-urban poor to fulfil multiple functions. Their special adaptation to harsh environmental stresses and poor husbandry practices has made them the best choice of breed for smallholder production systems (Dessie *et al.*, 2011).

Local chicken rearing has been practised for many years in developing countries, since it has been proven as an appropriate tool to supply high-quality protein to fast growing population, providing extra income to poor farmers, especially women and disadvantaged

group .Poultry farming is a widely practised agricultural activity in Tanzania. About 66% of livestock keeping households in mainland raise some poultry (chicken, ducks, and turkeys) (Isam *et al.*, 2014). The poultry subsector is divided into traditional and commercial production systems. The peri-urban, rural and urban based traditional system contributes 94% of total chicken population and supplies most of the chicken meat and eggs consumed in rural, peri-urban and urban areas. It also supplies about 20% of the LC products in urban areas where commercial production is practised in the period between 1995 and 2003 the total chicken population on the mainland increased at the rate of 2.65% per year. (Moreki and Chilipasi, 2011).

The growth was mainly associated with increased local chicken population estimated to have grown at a rate of 4.3% per year between 1999 and 2003; the total population in the year 2010 was estimated to be 38 967 752 out of which 38 204 764 were LC. Between 2002 and 2006, egg production increased from 790 million to 1.8 billion (Moreki and Chiripasi, 2011). The increase was associated with sensitization on good poultry management practices and use of thermo stable Newcastle Disease Vaccine (NDV).

The per capita consumption of eggs also increased from 23 to 50 eggs per person per annum in the same period. Most eggs are consumed at the household level and little are spared/left for sale. In spite of such description the growth rate of the poultry sub-sector has been generally slow; this is according to the National Census of Agriculture (NSCA, 2003).

The rearing of chicken is popular in peri-urban and rural areas of most resource poor countries worldwide and Tanzania is among the one. Generally chickens are kept as means

of providing supplement food, extra income, and employment to family members and to capitalise on harvest wastes produced on farms as well as kitchen leftovers. Most of local chicken production systems are based on native, domestic species which require very low levels of costs or inputs. Local chicken comprises the major part of the poultry industry in many developing countries; and it has been a traditional component of small farms throughout the developing world (URT, 2009).

2.4 Economic and Social Significance of Local Chicken Production

The role of LC production creating a positive spiral of assets creation (Frands, 2007) and contributes to household's empowerment, (including purchasing power) Majority of the peri-urban households appreciate the opportunity to participate in chicken programme as it provide opportunities to meet with extension service providers, by doing so local chicken keepers they benefit economically as well as earning social capital in livelihood terms (Sonaiya, 2007).

The small scale local chicken project is a source of small income nevertheless significance income to peri-urban families throughout developing countries. A comparative advantage of small scale local chicken for peri-urban communities is the conversion of labour into cash in a shorter time, less capital requirement and with less risk than in the case of other enterprises such as small ruminants (Sonaiya, 2007).

Local chicken production plays a corresponding role to other crop-livestock income generation activities and therefore, can be the most self motivated sub-sector within the livestock poly- systems (Sanyang, 2012; Alders and Pym, 2009). Local chicken production is a helpful asset to the local human population even with its relatively low productive performance of 40 to 60 eggs per annum and 1.5 to 1.7 kg body weight at full

maturity age (Akinola and Essien, 2011), also incomes from sales of local chickens and eggs serve as reserve for important household expenditure (Ajala *et al.*, 2007).

2.5 Constraints of Local Chicken Production in Peri-urban Areas

The primary constraints facing local chicken production for livelihood improvement and poverty alleviation are institutional, organizational and policy. It is poor peri-urban dwellers and their families who run the smallholder chicken production system, but they are not organized and most government veterinary and extension systems do not reach out to them. Hence, they are left in an organizational vacuum with poor guidance from the Local Government Authority (LGAs); another constraint is the limited awareness among planners and the policy-makers about the possibility of using the smallholder LC production as a development tool (Frands, 2007). The efficiency and profitability of family enterprises using LC are restricted by disease outbreak, production constraints, and external factors. The limitations caused by viral diseases, notably ND, avian fowl typhoid, avian influenza, fowl pox and gumboro disease (Bell, 2009).

Tanzania peasants are faced with many problems; some of them are starting up capital and lack of chicken production education that hinder their performance as well as their output. The situation is worse in Tanzania because many farmers are peasants who practice subsistence farming (Kwigizile, 2007), MOAFS (2001), IFAP (2000). Peri-urban poverty is due to low farm product prices, insufficient access to credit, illiterates, and high livestock input price, lack of institutional support, poor transfer of local chicken technologies, and high price of private extension services.

2.6 Local chickens as an Entry Point to Improve Livelihoods

Many households in developing countries are involved in local chicken keeping; in most cases women are more involved than men in local chicken production (Abdulkareem,

2011). According to (Frauds, 2007) the link between local chicken interventions and improvement of peri-urban's household status along with the associated improvements in terms of nutrition and other benefits for the entire family seems to be direct.

The Local chicken production system is the most common bird production system among poor household in the peri-urban areas of developing countries. Local chicken keeping system is an arrangement in which the chicken collect most of their feed free of cost, without generating a vast income. On the other hand, it generates small but important income to peri-urban families throughout the development countries (Sonaiya, 2005). LC provide a practical and effective first step in alleviating hopeless peri-urban poverty and provide a ready source of cash, quality nutrients in the human diet, and are often essential for meeting important social and cultural needs and obligations (Mack *et al.*, 2005).

A daily income of the value of one egg can have a substantial influence on a very poor family's livelihood while the impact on a better off family will be minimal. Experience in numerous countries points to a number of reasons why local chicken can be used in a way that makes it a brilliant tool for poverty alleviation (Permin *et al.*, 2000). Some of these reasons put forward are: almost all peri-urban households own local chicken; they are mainly owned and managed by family members. There are few spiritual taboos related to local chicken; local chicken has socio-culturally importance; low cost technology is available; low investment is needed; smaller land is needed. Local chicken production is relatively environmentally friendly; 12 chickens under improved conditions are enough to make a variation for one household; chicken production can be a self-sustaining and income generating system; and local chicken production can serve to build up an entitlement base for poor household.

Surveys on the economic importance of local chicken in Africa revealed priorities for rearing as social security (82%), consumption (24%) and sale (18%). In Botswana, it is estimated that priorities for rearing are: family consumption (95%), source of income (65%), gift to visitors, (55%), hobby (14%) and others (including healing rituals and sacred) (12%). The fact that at the household level consumption and source of income ranked highest clearly indicates that LC plays an important role in poverty alleviation (Moreki, 2006). Also (Ajala *et al.*, 2007) recommended in their study done in Nigeria that, income from sales of indigenous chicken and eggs serve as a reserve for essential household spending.

2.7 Conceptual Framework

Local chicken production has contribution to household's income, food safety, and social aspects such as education, health, electricity, rituals, sacrifice, gifting, and time detection as shown in Fig. 1.

The conceptual framework for this study started with the focus on the smallholder farmer's demographic background. Age, sex, marital status, occupation, education level, household heads and policies influence local chicken production. This research work concentrated much on socio-cultural and economic importance of local chicken husbandry. In between the background characteristics of households there are influencing factors which include capital availability, farming experiences, labour, as well as existing policies, cultural practices, extension services, accessibility to inputs and credit services.

Furthermore, the study had the assumption that local chicken husbandry and its productivity which included management systems and production of chicken and eggs had

contribution to economic, social and cultural importance at household level. The economic importance from local chicken majors only on income to be accrued, food, affordability of households to have accessibility to social services such as education for children, health, water and sanitation, and energy are to be obtained through income accrued from local chicken.

For socio-cultural aspects, included the use of chicken as gift to relatives, and offered to guest of honour, time detection (cock's alarm), healing purposes, and rituals and sacred. There was an assumption that constraints such as disease outbreaks, predators, and theft, poor accessibility to credit and inputs, inadequacy of extension services, and unreliable market are considered in the study to be variables influencing local chicken production and productivity. One of the dependent variables which is increased income is influenced by independent variable which is local chicken production that associated with socio-economic, socio-demographic and socio-cultural aspects. The positive influencing factors of these variables produce the expected results, but when they are in negative sphere of operation the expected output would not be obtained. Hence, the study intends to assess the extent of local chicken contribution in examining the socio-economic importance and socio-cultural aspects among peri-urban households in reducing income poverty through LC production or keeping.

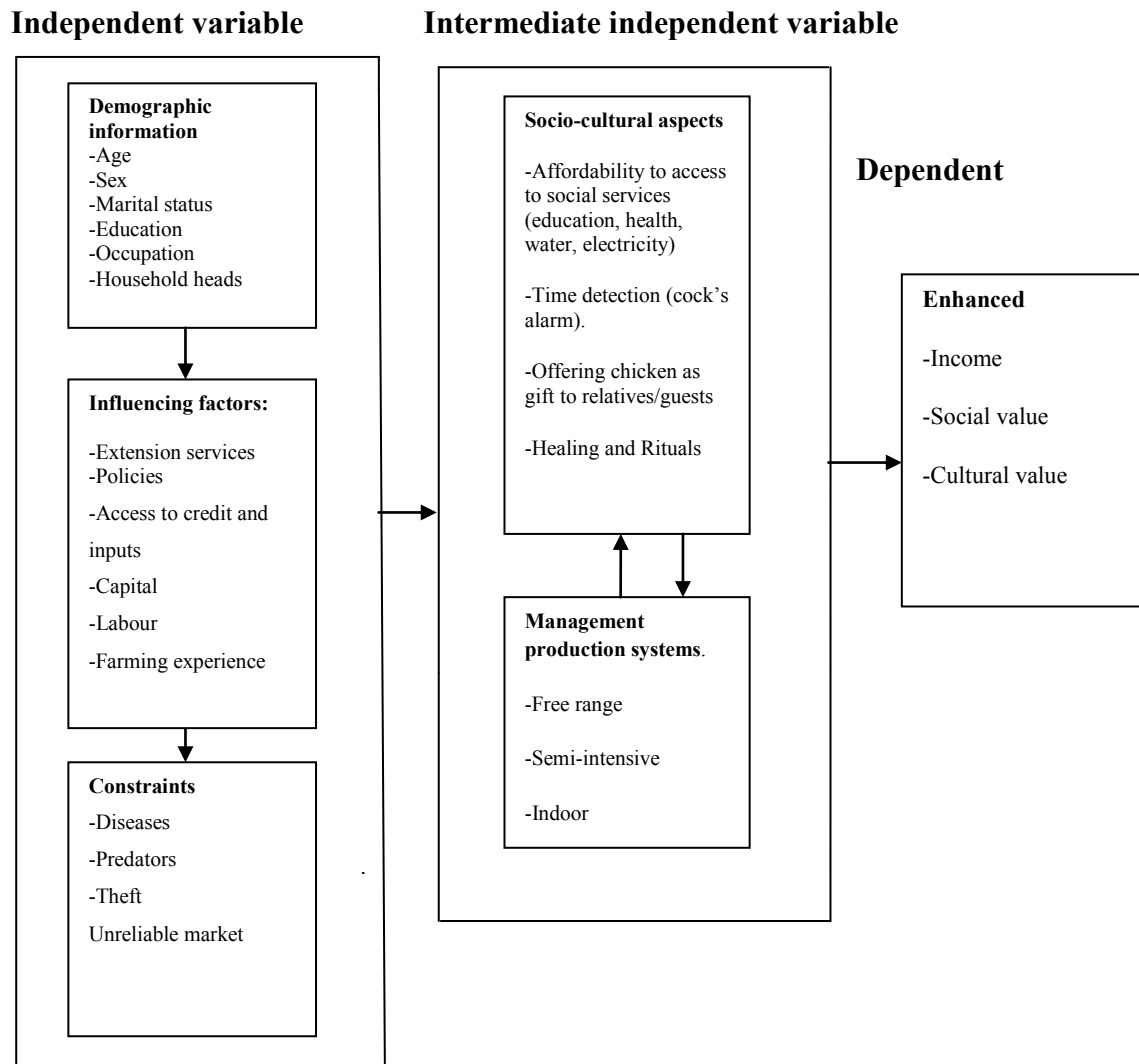


Figure 1: Conceptual framework showing relationship of variables

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Description of the Study Area

3.1.1 Location

This study was conducted in Kinondoni District, Dar es Salaam Region, Tanzania. The study was conducted in peri-urban areas of Kinondoni District, specifically in three peripheral wards that are Kibamba, Kwembe and Mabwepande whereby their major socio-economic activities are livestock keeping and horticultural crops production. Kinondoni is located in the northern part of Dar-es Salam city. It has an area of 531 km², and experiences a modified type of equatorial climate. Fig. 1 shows the map of Kinondoni District.

The reason of conducting this research in the Kinondoni District is that few researches in relation to the local chicken performance have been conducted in the district (URT, 2009). The other reason for selecting the area is based on the fact that there are three peripheral wards whereby most of the households keep local chicken as their income generating activity as well as source of food.

3.1.2 Climate

Kinondoni District is generally hot and humid throughout the year with an average temperature of 29⁰C. The average rainfall is 1000 mm (lowest 800 and highest 1300 mm). The climate is also influenced by the south-westerly monsoon winds from April to October and north-westerly monsoon winds between November and March. The main natural vegetation includes coastal shrubs, *miombo* woodland, coastal swamps and

mangrove trees. Kinondoni District has a large potential area in the peri-urban wards for adequate livestock fodders for zero grazing, but the situation was quite different for the respondents in the study area. The major type of livestock that the farmers kept was free range local chickens. Thus LCs was kept by all the respondents in the area (Table 3). This statement implies that the respondents had seen the advantage of keeping local chickens as opposed to other types of livestock. According to ICRISAT (2004), farmers raise chickens for eggs and for sale.

3.1.3 Population

The National Population and Housing Census of 2012 (URT, 2013) shows that Kinondoni had a population of 1 775 049 people, whereas 914 247 (51.5%) were female and 860 802 (48.5%) male. The population growth rate is estimated to be 4.3% per annum, and the population density is 1179 people per square kilometre. Administratively, the district is divided into four divisions, 34 different wards, and 172 sub-wards or streets.

3.1.4 Social and economic activities

The district envisions having a community with sustainable social and economic development through participatory resource mobilization and utilization, thus enhancing the quality of social and economic services by using existing resources and opportunities. The major economic activities include trade, manufacturing, tourism, transport and communication, urban livestock, forestry, fishing, mining, quarry, utility services, construction, finance and insurance, public administration and education (URT, 2013). The study area is characterized by different economic activities that households are engaged in. Among the main urban agricultural economic activities practised in the study

area include farming and livestock keeping. The main crops grown are vegetables and cassava.

Regarding farming, both peri-urban and urban farmers engage in small scale farming dominated by use of hand equipment. Few use tractors, power tillers and traditional upgraded technology. Livestock provides 134 060 tons of food in Kinondoni District (Mlozi *et al.*, 2004).

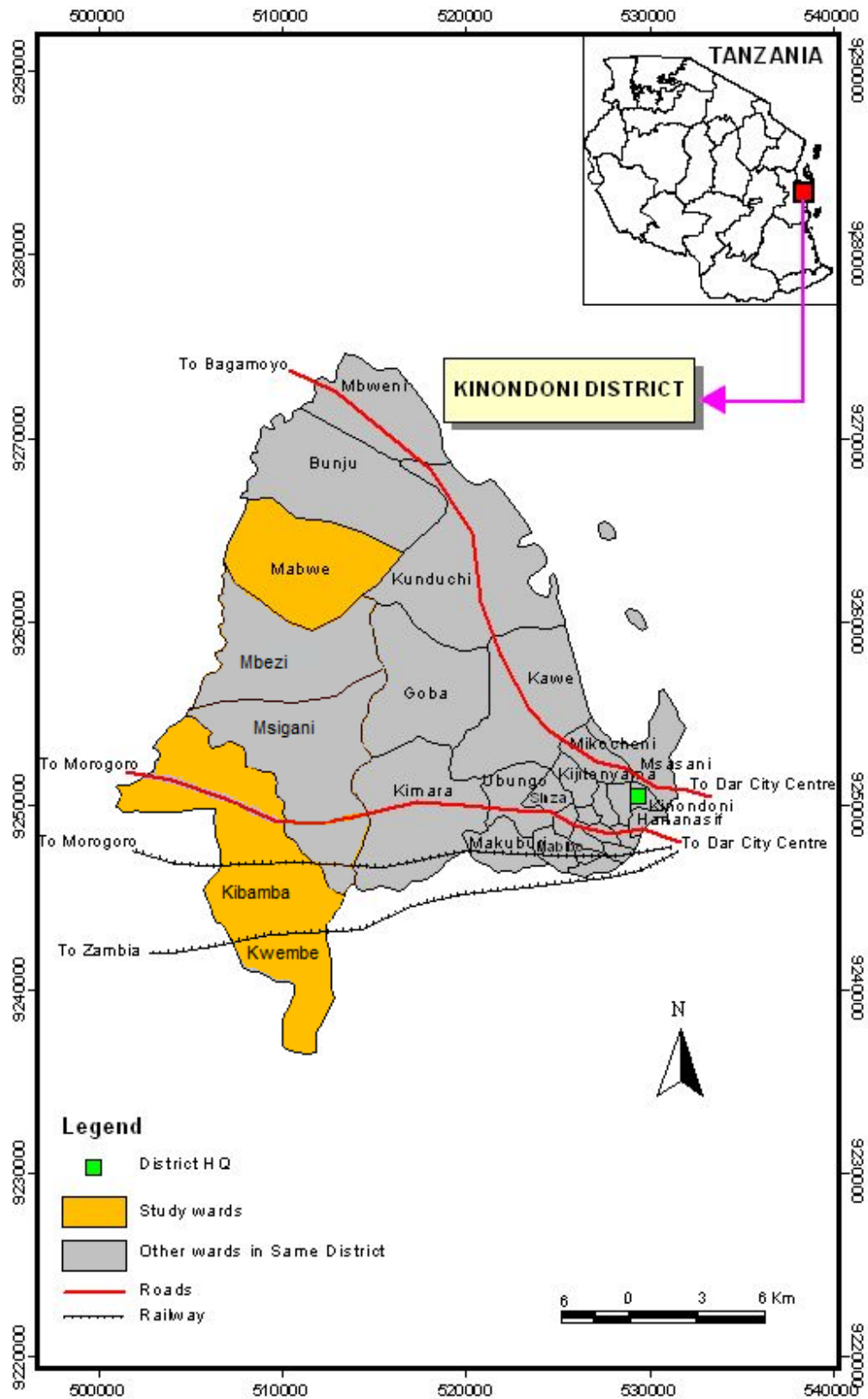


Figure 2: Kinondoni District Map (Location: $6^{\circ}47'0$ South, $39^{\circ}16'0$ East)

Source: Google map. Copyright @2005maplandia.com

3.2 Research Design

The study used a cross-sectional research design which allowed information to be gathered at one point in time. The data were collected for descriptive purposes and determining the relationship between variables under the study. The design was adopted because of its advantages in relation to budget costs and the nature of study objectives (Kothari, 2006). The cross-sectional design was considered appropriate in this study as it uses survey techniques in gathering data based on the nature of the objectives (Sunders *et al.*, 2007).

3.3 Sampling Techniques and Sample Size

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 of 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. (Matata *et al.*, 2010) advocated that 80 to 120 respondents are adequate for most of the socio-economic research in Sub-Saharan African households. Also

(Sunder *et al.*, 2007) argued that, a sample of 30 households is considered to a reasonable sample size which can be used in social science studies.

3.4 Data Collection

3.4.1 Household questionnaire survey

Both primary and secondary data was collected. For primary data, three methods namely household questionnaire survey, Key Informant interview (KI) and Focus Group Discussions (FGD) were used. Primary data were collected using a structured questionnaire consisted of both open and closed-ended questions. Moreover, personal in-depth interviewing approach was employed to collect data through key informant interviews and FGDs. 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.

3.4.2 Focus group discussion

Focus Group Discussions (FGDs) were also used to collect data; a semi-structured checklist guided the exercise. In each selected street, one Focus Group Discussion was conducted. The focus group discussants included different actors with different age and sexes. Each FGD had eight (8) participants whom were selected by considering long term experience in keeping LC and a number of chickens kept or owned. Direct observation was also employed to check and control the validity and reliability of the information gathered using household questionnaire survey and FGD.

3.4.3 Key informant interviews

Key informants were livestock extension workers, local government street executive officers and ward community development officer. Key informants are the people with

specialised great depth of knowledge on matters under study. The interviews were carried out in order to have further insights into issues pertaining to local chicken production as a source of income generating activities (IGAs) and food security (RIU, 2011). A checklist guided the interview.

3.4.4 Secondary information collection

Secondary data were gathered by reviewing relevant available documents that were obtained from the street local government office; Ward Livestock Extension Office, District Agriculture and Livestock Development Office (DALDO) up to the street level. Moreover, literature reviews were made from books, research reports, and Thesis/ Dissertations from Sokoine National Agricultural and Library (SNAL). Additionally, Government documents with information in LC relating with income poverty reduction were relevant sources to the study. The information collected included local chicken production, production technologies used, production constraints, contribution of local chickens to household income and food safety.

3.5 Data Analysis

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. Data for Objectives 1, 2, and 3 were analysed using descriptive statistics where frequencies, percentages, means and standard deviations were employed. Descriptive statistics were applied to determine whether the patterns described from the sample were likely to apply in the population where the sample was drawn (Johannes, 2006). For objective number four (determine factors

influencing income through local chicken keeping), a multiple linear regression model was used. The model was as follows:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + e_i$$

The variables from Y and X_1 to X_k are shown in Table 1.(i)

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 informant interview were summarised and reported.

Table 1: Variables used in the multiple linear regression model

Variables inserted in model	Variables	Measurement
Y	Income	Amount in TZS
X_1	Sex of respondents	Male = 1; female = 2
X_2	Age of respondents	Number of years
X_3	Education of respondents	Number of years in schooling
X_4	Marital status of respondent	Single = 1; married = 2; divorce = 3; widow = 4
X_5	Main occupation of respondent	Farmer = 1; civil servant = 2; self-employed = 3
X_6	Capital	Amount in Tshs
X_7	Duration of keeping local chicken	Number of years
X_8	Types of rearing of rearing systems	Free range = 1; Indoor = 2; Semi-indoor = 3
X_9	Types of labour used in keeping chicken	Family = 1; hired = 2
X_{10}	Owner of the local chicken	Women = 1; men = 2; both = 3
X_{11}	Accessibility to extension services in terms of veterinary services	Yes = 1; no = 0
X_{12}	Constraints facing the local chicken keepers	Diseases = 1; predators = 2; theft = 3; unreliable market = 4; lack of access to credits and inputs = 5

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Household Demographic and Socio-economic Information

The general characteristics of the selected households were based on the number of local chickens kept and on socio-economic and cultural aspects of the communities in the study area. The characteristics of the respondents included age, sex, education level, and marital status; work on farm and main occupations of household heads as indicated in Table 2. These variables were conceptualized as very important because they influence one's decision making and control over resources. Moreover they show relationships among gender groups, the level of understanding and commitment of resources into various economic activities.

These variables have significant impact on the adoption of new techniques of production. According to (Olujenyo, 2008), more aged farmers have long years of experience and thus are outdated methods of farming, traditional tools and species which do not encourage high output. Similarly, family size determine the size of labour available for the household and hence, impact on household production (Olujenyo, 2008).

4.4.1 Sex of respondents

Sex is one of the important components in the development process. About 33% and 67% of the respondents involved in keeping local chickens were males and females respectively (Table 2). This provides implication that the majority of males did not consider keeping local chicken as an important activity in their households whereas females considered local chickens as an important source of income. According to ILO (2000), the majority of

women in developing countries are neglected in resources ownership and local chicken is still observed as an inferior source of income for most males. In those countries, many females take the opportunity of keeping local chicken compared to males. The proportions of the respondents who kept local chickens are presented in Table 2.

4.1.2 Age of respondents

Table 2 shows the socio-economic characteristics of the respondents. Out of the 90 respondents, 50% were youth between 20 and 40 years old, while 28% were at the middle age of 41 to 55 years old, and only 22.2% were the old aged respondents above 55 years old. These findings indicate that, most of the respondents (78%) were within the active age group such that they had time and energy to perform various income generating activities including local chicken production to subsidize incomes which were generated from their main occupation. The age of farmers is an important factor in livestock production, because it may affect the level of efficiency at the project level (Nganga *et al.*, 2010). These results are similar with what was found by (Efaji, 2008) that in Tanzania the ages of economically productive class range from 18 to 60 years.

4.1.3 Education level

Education is always valued as a tool of independence to oneself from ignorance and enables the person to do non-traditional roles (Kasanga, 2005). This shows that education is very important for personal development. Thus, these study findings (Table 2) indicate that, most of respondents (73.5%) had primary level of education 1- 7 years of schooling. while very few (26.5%) had secondary school education of 4-6 years of schooling. Primary level of education for Tanzania is the basic education which is considered to be very important for smallholders because it enable them to follow small technologies

available for reading newspapers, leaflets, posters, newsletters and magazines and access the knowledge necessary in production activities.

This study findings are in line with what was reported by (Efraji, 2008) that, high literacy rate is an indicator of people knowing how to read and write; therefore education is an important input for understanding, it widens the scope, provides necessary managerial skills and adopt new production technologies more easily and creating a necessary strategies for fighting against poverty at household level.

Hence, this finding on literacy level suggest that, local chicken keepers in the study area had the basic education that could be used by local chicken development stakeholders to build their capacities for indigenous chicken production that will increase peri-urban household income, hence reduce income poverty and food insecurity. Based on the results from this study it revealed that, high education level strengthens the aptitude to make rational decisions, therefore it accelerates growth and development of LC enterprise (Jatto, 2012).

4.1.4 Marital status

Findings show that most of the respondents (76.7%) were married, while few (8.9%) were respondents who were single, 10.0% were widow and 4.4% were divorced (Table 2). This indicates that most of the women were in association with male counterparts which has socio- economic implication to the women incomes regarding access to and control over resources.

4.1.5 Household heads

The study findings revealed that most of the household heads (77%) were males while very few household heads (23%) were females (Table 2). The large number of male

household heads reflects the real situation of African cultural context where males dominate for being household heads, which has effects to female income and income generating activities.

For example (URT, 2007) reported that, women in male headed households have less access to and control over resources. Having more male household heads than female household heads implies that, distribution of production resources and control over resources are dominated by men as a result, reduce the capacity of females to fully engage in local chicken production and consequently resulting into increased income poverty and food insecurity among the peri-urban households.

4.1.6 Employment

Employment is valued as the means of fighting against poverty (Efraji, 2008). Therefore, knowing the main occupation of the respondents in the study area was vital. For this case an analysis of the same was conducted. Findings presented in Table 2 show that, majority of the respondents (62.2%) had farming activities as their main occupation while very few of them (37.8%) had other non-farm activities as their major source of income.

Farming and non-farm activities to the respondents were dominant to local chicken production because they were sources of valuable inputs such as feeds and cash that were required in chicken production, this implies that, livestock is the main employer for majority of peri-urban households including the urban households. This study is in line with what was reported by (Sanyang, 2012) that agriculture is the main employer for most of the and peri-urban population in Tanzania.

Table 2: Demographic characteristics of respondents (n=90)

Demographic information	Frequency	Percentage (%)
Sex		
Males	30	33.0
Females	60	67.0
Age		
20 -40	45	50.0
41 – 55	25	27.8
>55	20	22.2
Education level		
Primary education	66	73.5
Secondary education	24	26.5
Marital status		
Married	69	76.7
Widow	9	10.0
Single	8	8.9
Divorced	4	4.4
Household heads		
Adult male	69	76.7
Adult female	21	23.3
Occupation		
Farmers	45	50.0
Self-employment	34	37.8
Civil servant	11	12.2

4.2 Local Chicken Keeping and Related Activities

4.2.1 Types of local chickens kept

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 3). This was revealed by getting total number of local chickens from each household through my questionnaire, on question number 20 and 22 and from the ward livestock extension officer. During Focus Group Discussions conducted in all the six streets who reported that Bukini LC breed is kept at a large number compared to other breeds for many years ago, because they are good mothers and resistance to diseases. (Hossen, 2010) also got the similar reason in Bangladesh.

Table 3: The types of local chicken (LC) kept in the study Area (n=90)

Types	Frequency	Percentage (%)
<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

4.2.2 Number of local chicken (LC) kept from 2013 – 2014 (n=90)

At the household level (Table 4) the proportion of respondents with less than 15 local chickens in the year 2013 was reported to be 22.2%, while in the year 2014 the proportion of respondents with such number of local chickens was only 5.5%. During Focus Group Discussions and key informant interview conducted in Kwembekati, Kiluvya, Luguruni, MpijiMagohe, Mbopo and Mabwepande streets, the discussants reported that the main reason for increase in the number of local chickens was that chicks from day old to four weeks are kept indoors to avoid predators like claws, snakes, squirrels and *komodo* lizards. The average number of local chickens kept in the 2013 and 2014 years were 1986 and 2285 respectively, for semi-intensive, free range and indoor systems. The findings show that there was an increase in the numbers of local chickens kept.

Table 4: The number of LC kept at the year 2013 – 2014

Number of LC	2013 (n=90)		2014 (n=90)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
< 15	20	22.2	5	5.5
15 – 50	16	17.8	20	22.2
51 – 101	9	10.0	14	15.6
102 – 152	30	33.3	22	24.5
>152	15	16.7	29	32.2

4.2.3 Types of rearing systems used by respondents in the study area

The common rearing systems used in the study area for chicks and chicken are shown in Table 5. 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 (Moges and Dessie, 2010) that free range system in keeping local chicken has low input hence low output that is why many famers prefer the system to others. An assessment conducted in Bure District, North West of Ethiopia about free range peri-urban production

system and evaluation of the productive and reproductive performance of local chicken revealed that the system is very cheap to apply because of low initial capital used.

The study findings revealed that, majority of the farmers in the study area preferred free range as it is cheaper than other systems; chickens are kept indoor at night. The houses were constructed using mud bricks or timber off cuts, while roofing materials was corrugated iron sheets. The house floors were either on the ground or rised. Most of the chickens were housed at night and left to search for food by scavenging during the day time. Semi-intensive system were practiced by few farmers in the study area, however its management is not labour intensive, the family labour is sufficient in managing chickens.

During the day chickens were confined within the fence, where maize bran was provided as the sole feed ingredients. Although maize is reach in energy, but it is known to be low in other nutrients such as vitamins, minerals and protein. Despite this, an increase in number of eggs, hatchability, egg weight, and chicks' survival was noted. Veterinary drugs and animal feeds were accessed differently in the study area. Observations showed that, only streets which were along the highways had easy access to inputs shop in their street which are officially registered. Kwembe kati, Kiluvya, Luguruni and Mpiji magohe streets had adequate input supply with registered shops.

The other streets of Mbopo and Mabwepande were far away from input shops. The results obtained from FGDs showed that, local chickens performed better in all streets where there were registered shops, and reached market weight at five months for cocks and seven months for hen, than those in other streets lacking registered input suppliers. Therefore the local government authority (LGA) should consider putting priorities of building

infrastructures in those areas including passable feeder roads throughout the year, which will motivate people to invest on input shops.

Table 5: The types of rearing systems practiced in the study area. (n=90)

Rearing systems	Frequency	Percentage (%)
Free range	56	62.2
Semi-intensive	20	22.2
Indoor	14	15.6

4.2.4 Place where local chicken sleep at night

The findings in Table 6 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 the conditions were more or less the same in all the six studied streets. 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.

This implies that, within the study area chicken are not properly managed which results into poor chicken growth and production. This shows that if housings were improved the number of chicks would have increased more, than what they had reported in Table 6.

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 construction of shelters should use locally available materials to reduce high costs in such a way that they are easy to clean, they are well ventilated and are cheap. According to (Horst; 2000), farmers construct good local chicken shelters because of experience they

get from their parents and neighbours, advice from livestock extension workers and need to protect their local chickens from natural hazards. Furthermore the study findings revealed that, most of the local chicken keepers constructed LC shelters with small sized windows in order to protect thieves to pass through and steal chickens.

Table 6: The place where Local chicken sleep at night (n=90)

Place	Frequency	Percentage (%)
Special house/shelter	63	70.0
In the kitchen	20	22.2
Same house with human being	7	7.8

4.2.5 Common Diseases and other Problems Affecting Local Chickens

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 (Table7). The traditional methods of keeping local chickens in the developing countries, especially in Tanzania, make farmers earn little benefit (URT, 2009). 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. However, lack of enough government extension workers was also another issue that created resistance of farmers not to vaccinate their local chickens (LC). A study on poverty alleviation through free range LC improvement, which was done in Uganda, reported that poor productivity of local chickens was a result of high mortality rate due to Newcastle disease and predators.

Newcastle disease (ND) has been reported to be the main cause of chickens and chicks loss in various areas in Africa (Kusina *et al.*, 2001; Aboe *et al.*, 2006). 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 7: The common diseases and other problems affecting chicken and chicks (n=90)

Problem affecting LC	Frequency	Percentage (%)
Newcastle disease	78	86.7
Fowl pox disease	9	10.0
Presence of predators	2	2.2
Worm infestation	1	1.1

4.2.6 Treatment of local chicken diseases

The results in Table 8 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 (Bukenyi *et al.*, 2007).

The traditional methods of keeping local chickens in Tanzania, especially in Kinondoni District, make farmers earn little benefit. The economic benefits resulting from local

chickens contributes to improve the 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 antibiotics because it is costly compared to traditional herbs. The results show that Newcastle disease contributed to 86.7% of deaths, followed by Fowl pox disease which contributed to about 10% for both adult chickens and chicks Table 7. In order for the farmers to increase LC production the local government authority (LGAs) should subsidize the cost of drugs to make them affordable by small scale farmers, hence the use of traditional herbs will be stopped and encourage the use of modern drugs efficiently.

Table 8: Type of treatment used, modern drugs and traditional herbs (n=90)

Healing purposes	Frequency	Percentage (%)
Yes= (used traditional herbs)	10	11.1
No= (used modern drugs)	80	88.9

4.2.7 Farming experience in local chicken keeping

According to Table 9, about 55.5% of the sampled local chicken keepers had been in the LC keeping business for 5 years. Only 18.7% of the respondents had been keeping local chickens for more than ten years. This indicates that local chicken keeping in Kinondoni District started several years ago hence farmers had a long traditional experience on LC production therefore, farmers need to be imparted with new skills and technologies on chicken keeping production.

Table 9: Farming experience on local chicken keeping (n=90)

Duration of LC keeping	Frequency	Percentage
1 - 5 years	50	55.5
6 - 10 years	23	25.5
More than 10 years	17	18.7

4.2.8 Capital and its sources for keeping local chicken

The results in Table 10 revealed that there are 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.

Table 10: 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

4.2.9 Initial costs used to start keeping the local chickens

The findings in (Table 11) 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, KIs 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 roosting, laying boxes and a special place for chicks rearing. The majority ranged from 51 000 to 91 000 TZS accounted for 33.3%, and the minimum range of initial capital was TZS 10 000 to 50 000, which accounted for 28.9%, while the maximum initial capital was above TZS 171 000, which was also accounted for 4.4%. This shows that majority had initial capital below TZS 171 000. The overall average of initial cost for keeping LC was $122\,922 \pm 140\,532$ TZS with a minimum of TZS 8000 and maximum of TZS 858 000. 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 the enterprise.

Table 11: Initial cost used to start keeping local chickens (n=90)

Costs (TZS)	Frequency	Percentage (%)
51 000 – 91 000	30	33.3
10 000 – 50 000	26	28.9
91 000 – 131 000	20	22.2
131 000 – 171 000	10	11.1
>171 000	4	4.4

Minimum=8000; Maximum =850 000; Mean = 122 922 ± 140 532

4.3 Contribution of Local Chicken to Socio-economies Among Peri-Urban

Households

4.3.1 Contribution of local chickens to household's income

The study findings (Table 12) 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. The study shows that, local chickens contributed to an annual average income of TZS 1 831 591 ± 2 146 869, of which a minimum income was TZS 10 000 and maximum income was TZS 12 000 000.

The findings show that LC production is an important source of income which contributes to the household (Table 12). This probably shows that the famers improved their income through local chickens keeping. Therefore, it shows that there was an improvement of income among the farmers, probably due to most of the farmers vaccinating their chickens against Fowl pox and Newcastle diseases regularly (Table 8). A study done by (Alabi and Osifo, 2004) in Nigeria found that farmers who used to vaccinate their chicks regularly had a substantial increase in number of chickens resulting into an increased income.

Table 12: Income/Earnings from selling local chicken per year (n = 90)

Income in TZS	Frequency	Percentage
< 50 000	12	13.3
50 000-100 000	24	26.7
>100 000	54	60.0
Minimum= 10 000, Maximum =12 000 000, Mean = 1 831 591 ± 2 146 869		

4.3.2 Social Relations within the Households

4.3.2.1 Ownership, control and decisions making by gender

About 50% of both male and female owned local chickens, followed by 37% of female owned LCs, while male only accounted for 13% of owned local chickens (Table 13 and 15). 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 and nutrition (FAO, 2000).

Men have control over large animals which enables them to acquire and reproduce their power at the households. As (Alabi and Osifo, 2004) 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 13: Ownership and decision making on LC by Gender in the Households
(n=90)

Ownership	Frequency	Percentage
Both male and female	45	50.0
Female	33	36.7
Male	12	13.3
Decision making		
Both male and female	45	50.0
Male	12	13.3
Female	33	36.7

Most of respondents kept local chicken for domestic consumption rather than for commercial purposes. However, the local chicken (LC) has a good market in the study area and outside. For the majority, the sale of local chickens takes place only when there are household critical needs or problems. During FGDs participant 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 13, 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 13).

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 (Alders, 2000).

4.3.3 The people most involved in caring local chicken (LC) at household level

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 14). 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.

Table 14: The people most involved in caring for local chicken in the household**(n=90)**

Most involved in caring	Frequency	Percentage (%)
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

4.3.4 Control and Accesses of income from local chicken

4.3.4.1 Control of income from local chicken

The term household, according to (Nkwera, 2010), is a single or a group of people living and eat together also share common living arrangements. For households that are led by men, decision making and resources distribution rest within their hands and thus leave the women aside without having control over household resources, and the vice versa is true (URT, 2007; URT, 2011).

The findings in Table 15 show that women had higher 50% control over income from local chickens than other members of the household. These revealed during the FGDs conducted at Mabwepande and Mbopo streets, participants said it was their tradition that income from local chickens was controlled by women. For the households having more than one source of income, women were mainly assigned to take care of local chickens while their husbands did other jobs. In most cases youths had low control over income because they are still under their parents' control. In a situation where local chicken does not make a significant contribution to total household income, the control remained to women and children who can make decisions to its uses.

Table 15: Control and Access of income from local chickens (n=90)

Income control	Frequency	Percentage
Wife	45	50.0
Husband	33	36.7
All members	10	11.1
Youth	2	2.2
Income access	95	95.0
All members	3	3.3
Women	2	2.2
Men		

4.3 4.2 Access to income from local chickens

The findings in Table 15 show that, local chicken incomes of most of the sampled households (95%) were accessed by all household members. The access to income from peri-urban local chicken farming was for all members in the households as it was used for household consumptions or other purposes. Although, women had greater control of LC than any other members in the household, therefore all members had access to the income accrued from the LC. This is contrarily to what had been expected that women were in a position of having more access to this income than other members.

Table 16: Main sources of income and their respective percentages

Source of income	n	Minimum	Maximum	Mean	Std. Deviation	Mean %	Stddev
Crop	34	80 000	14 400 000	1 108 235.29	2 492 472.57	20.11	32.94
Livestock	18	40 000	10 000 000	1 059 777.78	2 307 805.77	7.54	19.74
Local chickens	66	10 000	12 000 000	1 831 590.91	2 146 869.86	45.49	30.49
Salary	17	80 000	36 000 000	6 195 882.35	8 083 650.98	13.92	30.62
Property sales	35	100 000	22 000 000	2 883 437.14	4 177 596.39	24.03	37.04
Average	90	62 000	18 880 000	4 313 385.4	3 841 679.12	22.21	30.16

4.3.5 Expenditure from local chicken earnings

4.3.5.1 Expenditure on food

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 17. This implies that, income

from LC production was mainly used for purchasing food. Table 16 shows that, farmers had other sources of income however local chicken contributed about 45.5% of income among others.

The study revealed that majority of farmers involved in LC keeping (91.1%) had the ability of getting three meals per day (Table 17). This shows that local chicken keeping contributes to improving food security at the households of the LC keepers.

Table 17: Expenditure from local chicken earnings for HH food (n=90)

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

4.3.5.2 Expenditure on health services and education

The findings indicate that earnings obtained from local chickens' production were used to secure health services for the household members Table 18 and this was accounted for 45.5% .This was also revealed during the FGDs and key informant interviews conducted in all the six streets. The participants pointed out that most of the farmers spent some income from local chicken earnings to access health services and paying bills for children's education and other social services.

Table 18: Expenditure from LC earnings on health services and education (n=90)

Expenditure in Health services(TZS)/month	Frequency	Percentage (%)
9000 -19 000	74	82.1
19 100-29 100	4	4.4
29 200-39 200	5	5.6
>39 200	7	7.8
Expenditure in Education in(TZS)/year		
10 000-100 000	74	82.0
101 000-201 000	6	6.6
202 000-302 000	2	2.2
>393 000	8	8.8

Summary of health expenditure: Min = 10 000; Maximum = 1 500 000; Mean = 209 889; SD. = 299 088

Summary of Education expenditure: Maximum = 500 000; Minimum = 9000, Mean =55 875; SD=100 711

The findings in Table 18, further revealed that 82% and 8.8% of farmers spent about TZS 10 000 – 100 000 and more than TZS 393 000 respectively for education especially in school fees, uniforms and stationeries for their children per year. The figures may be interpreted that some local chicken keepers spend their earning for primary and secondary school children, while some households have children in higher learning institutes.

4.3.6 Ability to acquire assets

The findings in Table 19 also indicated that earnings from local chickens were used to purchase assets for the household. Out of the 90 respondents, 84.4% managed to buy domestic utensils, while 6.7% purchased building materials and 3.3% bought motor bikes. In all of the assets acquired by the smallholder local chicken keepers, 45.5% were income from local chickens and their products, while other sources contributed at a range of 24.03 to 7.54% (Table 16).

Table 19: Assets acquired (n=90)

Assets acquired	Frequency	Percentages (%)
Domestic utensil	76	84.4
Building materials	6	6.7
Motorbikes	3	3.3
Bikes	2	2.2
Sim tanks	2	2.2
Solar panel	1	1.1

4.3.7 Social-cultural aspects and economic importance of local chickens

Social-cultural aspects for keeping local chickens are ranked in a descending order of preference from 1 to 4 as shown in Table 20 and discussed below.

Table 20: 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

Multiple responses

4.3.7.1 Home consumption

Findings of this study indicated that all households (100%) consumed chicken meat and eggs from chickens (Table 20). 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 (Dolberg, 2008). 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.

4.3.7.2 Local chickens used for honouring guests (gifts)

Local chickens are among the livestock which are multiple uses apart from nutritional uses and income generation. Findings show that LC are kept for multiple purposes, however 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 20). The findings presented in here are similar to (Aklilu, 2007) who reported that local chickens are used socio-culturally for mystical functions such as hospitality and exchange of gifts to strengthen social relations.

4.3.7.3 Local chickens especially cocks are used to detect time

Before inventing wall clocks and cell phones, people in the peri-urban areas used cocks as alarm clocks to detect time 86.7% (Table 20). (Gueye *et al.*, 1998) 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.

4.3.7.4 Local chickens used for traditional healing and ritual purposes

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 (WHO, 2002; 2005). 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 witchcraft practices (33.3%), Table 20.

4.4 Constraints and Suggested Solutions in Local Chicken Keeping Activities

4.4.1 Constraints facing local chicken keepers

Local chicken production, like any other income generating activities undertaking, face a number of constraints which include diseases, inadequacy of extension services, predators, unreliable market, theft and poor access to credit and inputs (Table 21).

Table 21: Constraints facing local chicken keepers (n=90)

Constraints	Frequency	Percentage (%)
Diseases outbreak	87	96.7
Poor access to credit and inputs	86	95.6
Inadequacy of extension services	76	84.4
Presence of predators	63	70.0
Unreliable market	45	50.0
Theft	30	33.3

Multiple responses

The study findings show that, LC keepers in the study area were facing a number of constraints. The responses are as presented in Table 21. Majority 96.7% of the respondents reported to have been facing with various major problems including disease outbreaks, while very few respondents 33.3% reported on facing the problem of theft. Majority of peri-urban households who faced problems in keeping the local chicken implies that, indigenous chicken enterprises are risky task. The findings of this study agree with what was reported by (Permin *et al.*; 2000, Minga *et al.*; 2002; and Moreki; 2006) that local chicken enterprise faces many constraints, but NCD is the major constraint.

Local chicken production in Kinondoni District was faced by various constraints, and these have been ranked from 1 to 6 in descending order of intensity and seriousness (Table 21). The findings of the study further indicate that the government did not do much in provision of adequacy extension services, initial capital, and new technology, reliable and better market of local chicken, information and training based on local chicken husbandry.

4.4.1.1 Diseases outbreak

Diseases outbreak was reported to be the major constraint to the chicken productivity. The study found that Newcastle disease, fowl pox, fowl typhoid and infectious coryza are the major chicken diseases in Tanzania (Table 7). In a similar study on the disease trends and prospects of reducing losses in scavenging local chickens in Tanzania, (Muhairwa *et al.*, 2001) reported that fowl pox, infectious coryza, ND, Marek's diseases, chicken infectious anaemia and ecto-parasites are causes of mortalities. However, chicken infectious anaemia and Marek's diseases were reported for the first time in local chickens (Table 21). In order to overcome the problem of disease outbreak in local chickens, the government should provide free vaccines against fatal diseases as it is done in other livestock such as dogs and cats against rabies disease (Table 22). Their views are similar to suggestions given by farmers in Cameroon that improving the management of the production system may reduce incidences of diseases, hence better productivity of traditional breeding (Fosta *et al.*, 2007).

4.4.1.2 Poor access to credit and inputs

The low capital and poor access to credit for efficient running of local chicken projects influenced 95.6% of the local chicken keepers to prove failure (Table 21). The farmers gave their suggestions that in order to improve the situation, deliberate efforts should be

made by local governments to link producers/farmers to financial institutions such as Kilimo Bank and other banks for credit provision (Table 22).

4.4.1.3 Inadequacy of extension services

The findings of the study indicated that the Local Government Authority (LGA) did not do much in provision of extension services based on local chicken husbandry (Table 21) and this was accounted for 84.4%. The farmers gave the suggestions that the governments have to provide extension workers for local chicken keepers (Table 22). Based on their suggestions, they were advised that capacity building in training of community animal health workers (CAWs) or Para veterinarians will have substantial input in the areas of local chicken improvement.

4.4.1.4 Presence of predators

It has been reported that 70% of the constraints are predators such as crows, snakes, *komodo* lizards, wild cats, foxes, raccoons, squirrels, wild cats, dogs and birds of prey represent the main causes of predator losses, especially in young birds where there are serious pertinent problems for all the respondents (Table 21). Human beings can also represent another important predator for adult chickens

In order to control predators the following measurements should be taken: Proper shelter should be constructed using locally available materials, and predators should be trapped, hunted or repelled by specific plants For example, in Nigeria, sliced garlic (*Allium sativum*) is placed around chicken houses to repel snakes. The most effective means of predator proofing is locking up chickens at night before twilight in a secure cage. Situating

the cage in close proximity to the house not only discourages wild visitors but also allows for quick action if an invasion occurs.

A perimeter fence is needed to keep the chickens in a protected outdoor area during the day. Any fence has to be at least five feet high. Fences can be made from a variety of locally available materials, but durability is essential for long-term security. Woven wire fencing is best (two-inch gauge or less) because there are no welds to corrode and break. The fencing has to be buried underground at least a foot or folded outward on the ground for a foot and a half to prevent burrowing predators.

4.4.1.5 Unreliable market

It has been reported that, 50% of the constraints in Kinondoni District and other many African countries is unreliable market and traditional system of keeping local chickens which gives low outputs to the farmers (Table 21). If large production is considered, many questions related to marketing such as price, customers, input price and input availability will suddenly become important and influence the farmers' strategies and decision making (Pedersen, 2002; Mlozi *et al.*, 2003). The findings were also supported by participants in FGDs that, unreliable market was a problem to most of the farmers.

4.4.1.6 Theft

The findings in Table 21 also indicate that theft is another challenge for local chicken smallholders' production. Human beings can also represent another important predator for local chickens. Therefore, 33.3% of respondents had problems with theft; however, 66.7% of the respondents did not have any problems at all. In order to control the theft problem, the local chicken shelters should be built in close proximity to the residential houses to

allow for quick action if an invasion occurs. Keeping dogs at home also helps to stop thieves who would steal chickens.

4.4.2 Suggestions given by farmers in improving local chicken husbandry

Farmers had given various suggestions for improving local chickens keeping husbandry (Table 22). Majority of the LC keepers put forward suggestions that request government to provide with them among other free vaccines (100%), extension workers (97.8%), and training programmes on local chicken keeping, prioritization of LC industry (77.7%). Based on their suggestions provided by them, it may be said that there are important strategies for improving local chicken production.

Table 22: Suggestions given by farmers to improve LC projects

Farmers comments	Frequency	Percentage (%)
Govt. to provide free vaccines against fatal diseases	90	100.0
Govt. to provide extension workers at our areas	88	97.8
Govt. to provide training program on LC keeping	85	94.5
Govt. to provide high breed cocks to improve LC breed.	79	87.8
Govt. to provide us grants or affordable credits	75	83.3
Govt. to prioritize LC industry	70	77.7

Multiple response

4.5 Factors Influencing Income through Local Chicken Keeping

Table 23 presents results from the regression model showing the influencing factors leading to income from the local chicken keeping activities.

Table 23: 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

Table 23, indicates that some variables such as education level showed to be significantly influenced income through local chicken at $p = 0.011$, while initial capital at $p = 0.047$, experience on keeping the local chicken at $p = 0.006$, type of rearing systems at $p = 0.007$, accessibility to extension services at $p = 0.045$ and constraints at $p = 0.005$.

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 (Efraji, 2008 and Nzobana *et al.*, 2013) that, education is very important for personal development.

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 (Permin *et al.*, 2000; Sanyang, 2012). 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.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Based on the findings of the study, it is concluded that, generally LCs could help peri-urban households improves the socio-economies and address income poverty among poor households and community members in the study area if improved LC husbandry will be practiced. LC 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 LC 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.

The peri-urban households' income was found to be positively influenced by the number of chicken sold per year, including remittance received and other business performed. The LC production was negatively influenced by diseases outbreak, predators, lack of balanced feeds, free range system used and poor housing impacted the number of LC produced and sold thus influenced the amount of income accrued from it.

5.2 Recommendations

Recommendations Based on the major findings of the study, the following are the recommendations drawn towards improving local chicken production and productivity at the household level in the study area and other areas with the same environment:

(i). Improving access to capital

Although peri-urban and urban local chicken farming was found to contribute significantly to total household income, shortage of capital was a major problem for

peri-urban LC keepers. This calls for banks and other financial institutions to look for possibilities of giving loans to peri-urban LC keepers. The loans should be well designed in terms of repayment period (should reflect life cycle of the animal and long enough) and interest rate to suit the long growth period of LC enterprises. Provision of capital will enable peri-urban LC keepers to expand their LC business and increase its contribution to total household income.

The capital can be in kind in the form of chickens, farm inputs or in the form of cash. All these will enable the poor who are disadvantaged to participate in peri-urban LC keeping. Participation of the poor in peri-urban LC farming would likely reduce income inequality.

(ii). Improving local chicken husbandry practices

To improve the husbandry practices, the study recommends that significant efforts should be put by the Local Government Authority (LGAs) in stimulating production through sensitization on developing local chicken keeping as a business. To conduct training among selected local chicken keepers who show interest in the LC sub-sector. Awareness creation on disease incidences, detection and control measures as well as developing and mainstreaming diseases advisory and management competence among LC keepers is needed.

Furthermore, the government should make sure that extension services, veterinary drugs and vaccines are made available and affordable as well as providing training on disease management. Based on the status of local chicken production and general structure of the sub-sector, the study recommends combining services delivery and facilitation while at the same time making efforts to engage and create private sector participation in the long term. Capacity building through training of community animal

health workers (CAWs) or para-veterinarians will have substantial input in the areas of local chicken improvement where extension agents and veterinarians are inadequate.

(iii). Government to provide priority on local chicken industry

Efforts should be made by the Local Government Authority and other chicken development stakeholders such as World Vision, REPOA and Heifer project to make sure that, local chicken keeping is promoted as a business rather than subsistence as it is now. The Municipal and District councils and other stakeholders, should provide them with incentives by helping LC keepers to improve production and get access to chicken market.

(iv). Review of peri- urban and urban livestock policies and by-laws

Most peri-urban LC keepers have been operating without formal recognition of their main livelihood activities and they lack structural support, policies and regulations. This necessitates review of the existing policies and by-laws which seem to be confusing. In addition to the review of policy documents, recognition of peri-urban and urban livestock farming needs to be reflected not only on policy documents but also on day to day operations of Municipal and District authorities.

(v). Reducing cost of livestock farming

Although local chicken was found to contribute to employment in peri-urban areas, returns from the LC business were found to be low due to the rising cost of keeping local chicken. Peri-urban and urban LC keepers could increase their returns and employ more people if the government subsidizes livestock farming inputs for a given time period.

(vi). Enforcement of laws and regulations governing provision of public veterinary services

The higher cost of keeping LC is also attributed to high veterinary costs. Veterinary services have turned into business rather than services. Extension workers who are government officials misuse their offices by offering their services as private business rather than civil servants. The District council authorities should make sure that public veterinary officers abide to the laws and regulations which govern provision of their services.

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APPENDICES

Appendix 1: Questionnaires for local chicken keeping households

A: HOUSEHOLD IDENTIFICATION:

Name.....Village.....Ward.....Division

District/Site.....Region.....

Date of Interview.....Name of Interviewer.....

B: HOUSEHOLD BIODATA:

1 Household size and composition

Person	P1	P2	P3	P4	P5	P6	P7	P8	P9	P11	P12	P13	P14	P15
Sex														
Age														
Education level														
Marital status														
Main occupation														
Work on farm														
Household head														

Sex	Education	Marital Status	Main occupation	Work on farm	Household head
1. Male	Number of years	1. Single	1. Farmer	1. Full time	1. Adult male
2. Female	In schooling	2. Married	2. Civil servant	2. Part time	2. Adult female
		3. Widow	3. Self-employed	3. None	3. Orphans
		4. Widower	4. Unemployed		
		5. Divorced	5. Education		
		6. Immature	6. Housework		
		7. Other	7. Sick, old, young		
			8. Other		

2 Give the sources of income and amount in TAS obtained per year

Source		
	Tick	Amount
Crop sales (name the crops)		
Livestock sales (name the products/livestock) apart from chicken		
Sales of local chicken products		
Salaries (any type of employment)		
Sales of properties		
Other sources (Specify)		

C: LOCAL CHICKEN HUSBANDRY

- 3 What was the initial cost used to start keeping the local chicken? _____
- 4 What was the source of your capital? _____, _____,
_____, _____, _____
- 5 How long do you have experience with keeping the local chicken? (Answer in number of years)_____.
- 6 What are the types of chicken do you keep? (i) Kuchi (ii) Kishingo (iii) Bukin (iv) Kinyavu (v) Others (specify)_____, _____, _____
- 7 From question number 6 above, what types do you prefer most?_____, _____
- 8 What types of rearing system do you use for keeping the local chicken? Tick the appropriate one (s) (i) free range (ii) indoor (iii) semi intensive (iv) intensive (v) Others (specify).....,,
- 9 What type of labour used in keeping the local chicken? Tick the appropriate ones (i) family labour (ii) hired labour

- 10 From the question 9 above, do the labour involved in local chicken keeping permanent or not permanent? _____
- 11 Who is mostly involving in carrying out activities related with local chicken keeping?
Tick the appropriate one (i) Only female (ii) Only male (iii) both male and female (iv) female child (v) male child (vi) children (vi) all
- 12 Who own the local chicken? Tick the appropriate one (i) Only female (ii) Only male (iii) both male and female (iv) female child (v) male child (vi) children (vi) all
- 13 Do you have accessibility to extension services in terms of visits by the agents? Give number of visits per year _____
- 14 Do you have accessibility to extension services in terms of veterinary services? Circle one **Yes/ No**
- 15 If **Yes** what are these services? _____
- 16 If No how do you handle in occasions of problems (eg. Diseases)?

- 17 Do you have any accessibility to credits? Circle One YES/NO
If YES, from where? _____
- 18 If NO, how do you manage to keep the chicken? _____

- 19 What are the problems do you face in keeping the local chicken? _____

- 20 What is the status of production of your chicken? _____
- 21 Does the number of chicken increasing? Circle one YES/NO
- 22 If Yes, how much number of chickens produced per year? _____
- 23 If NO, what is the problem hindering? _____, _____,
_____, _____, _____

24 How many eggs do your chicken produce per day _____ per week _____
per month _____ per year? -----

D: LOCAL CHICKEN MARKETING

25 Where do you sell the live chicken? _____, _____, _____

26 Where do you sell the eggs? _____, _____, _____

27 Who set the price for local chicken products? Buyers () ii. Yourself ()
iii. Negotiation () Others (Specify)

28 What factors are considered in setting the price of local chicken? Weight () ii. Sex
() iii. Size () Others (Specify)

29 Are you satisfied with current price of local chicken products? Yes () ii. No ()

30 If yes or no, why (Explain)

.....
.....

E: ECONOMIC AND SOCIAL-CULTURAL IMPORTANCE OF LOCAL CHICKEN

31 How much is price of live chicken when during selling? _____

32 How much do you earn from selling chicken per day _____, per week _____ per
month _____ per year _____

33 How much is price of one egg when during selling? _____

34 How much do you earn from selling eggs per day _____, per week _____ per
month _____ per year _____

35 Do you think the income earning is enough? Circle one YES/NO

36 If YES or NO, how? _____

37 Is the earning from the chicken and their products sales enough? Circle one YES/NO

38 From question 37 above, how? _____

39 Does the earning from chicken use in purchasing food? Circle one YES/NO

40 If YES, how much do you spend per day _____

41 How many meals do you take per day _____

42 How much do you spend in acquiring health services? _____/year

43 How much do you spend for children's education _____/year

44 What is the contribution of local chicken to owning your assets? _____

45 Do you sometimes use local chicken as a gift for your guests who visit you? _____

46 Do you sometimes use local chicken to detect time? _____

47 Do you sometimes use local chicken for traditional healing purposes? _____

F: GENERAL COMMENTS

48 What are the challenges facing the local chicken projects?

49 Do you have any comment for improving local chicken project?

Appendix 2: Checklist for focus group discussion and key informant interview**A: Income of smallholder farmers from local chicken keeping.**

- Enough
- Not enough

B: Management systems used for raising the local chickens

- Free range
- Semi-intensive
- Indoor
- Types of chicken kept
- Accessibility to extension services
- Accessibility to credit and inputs
- Constraints and other problems facing local chicken keeping activities.

C: Economic importance of local chicken

- Contribution to income
- Contribution to food safety
- Contribution to affordability of social services
- Contribution to ownership of assets

D: Socio-cultural aspects of local chicken

- Giving gifts to guests and relatives
- Traditional healing
- Ritual purposes
- Time detection (cock's alarm)