

# Performance of Chickens under Semi-scavenging Conditions: A Case Study of Ilima and Lubanda Villages, Rungwe District, Tanzania

Angaza A. Gimbi<sup>1</sup>, Uswege M. Minga<sup>1</sup>, Catherine V. Kabungo<sup>2</sup>, Sophia F. Swai<sup>2</sup> and Roger Thomson<sup>3</sup>

<sup>1</sup>Department of Life Sciences, Open University of Tanzania,

<sup>2</sup>Department of Agricultural Research, Ministry of Agriculture food Security and Cooperatives, ARI-Uyole

<sup>3</sup>33 Boiler Beach Road, Kincardine, Ontario, Canada

Email: [angaza.gimbi@out.ac.tz](mailto:angaza.gimbi@out.ac.tz) and [agimbi@yahoo.com](mailto:agimbi@yahoo.com)

**Abstract:** A study was conducted in Ilima and Lubanda villages, Ilima ward in Rungwe district to assess farmers' socio-economic status and determine the productivity of local chickens and their crosses under village management conditions. A cross sectional survey design using structured questionnaires was used to collect demographic, chicken production, production constraints and income data from 340 households. The 340 households were selected from the two villages out of 600 households which participated in the *Vétérinaires Sans Frontières (VSF)* funded project between 2006 and 2008. Each of the 340 households was given one Rhode Island Red (RIR) rooster or hen for crossbreeding with local chickens. Data were analyzed using a Statistical Package for Social Sciences (SPSS) computer software.

Findings from the study showed that on the average, a household consisted of 5 people with mean age of 46.7 years and were mainly headed by males (77.8%), and that household's main sources of income were crop farming (42.4%), livestock production (42.0%), business (21.1%), wages (7.8%) and carpentry (6.7%). Each household had a minimum of one cross breed and one local chicken and a maximum of 15 crosses and 15 local chickens at the beginning of the Project in 2006. As a result of project intervention, the number grew to a maximum of 20 crosses and 30 local chickens per household. Monthly income obtained from chickens in the participating households was between 100/= and 90,000/= Tanzanian Shillings (TAS) with a mean of 11,777.55/= TAS. Chicken production constraints identified included diseases and parasites, unavailability of feeds during the dry season, theft, lack of chicken management skills, predators and lack of capital. An average of 16 chickens per household was lost per year due to diseases, predators, accidents, and theft. Diseases were the leading causes of chicken losses. About 71% of respondents vaccinated their chickens while 29.4% did not. Of the vaccines used, 98.2% were against Newcastle disease while 1.8% were against other diseases. Overall, the households which participated in the project benefited from it in terms of improved poultry management skills and income. It was recommended that farmers be further trained in improved chicken management practices including chicken immunization especially against Newcastle disease, prevention and treatment of parasitic diseases especially fleas as well as chicken house construction so as to avoid the risks of predators.

**Keywords:** Chicken production and constraints, household, income, village management conditions

## INTRODUCTION

The importance of rural poultry in national economies of developing countries and its role in improving nutritional status and incomes of many small holder farmers and landless communities has been recognized in the last two decades (FAO, 1982; Mokotjo, 1990). Village chicken production system in rural Tanzania is characteristically traditional and is an integral part of the farming system. Chickens have short life cycles and quick turnovers; low-input production systems with outputs accessible at both inter-household and intra-household levels; and a means of converting low quality feed into high-quality protein (FAO, 1982).

Land, a critical production resource in a number of rural areas of Tanzania, is not a limiting factor in village chicken production system. Consequently, disadvantaged groups in the community can be direct beneficiaries of village chicken improvement programmes (Saleque and Mustafa, 1996).

According to the Budget Speech presented by the Minister of Livestock and Fisheries Development (9<sup>th</sup> August, 2012) out of 60 million poultry in Tanzania, 35.5 million (59.2% were indigenous chickens and 24.5 million (40.8%) were commercial poultry, mainly broiler and layer chickens. About 2,778,000 (72%) of the total households in rural areas keep chickens with an average of 10 chickens per household. Most poultry products consumed in the country, especially in rural areas and in small to medium sized urban settlements are from the indigenous poultry and poultry keeping represents important sources of income to women in villages (Aboul-Ella, 1992).

Tanzania belongs to the low-income group of countries of the world. Over 38% of the population lives below the poverty line of USD 1 per day. Poverty in Tanzania is skewed towards the rural people who are the poorest compared to the urban and peri-urban population. In order to alleviate poverty in the country, efforts have been made by the Government of Tanzania to assist rural people raise their income through poverty eradication and wealth creation strategies such as improved crop and livestock production (NSGRP, 2010).

In order to augment the above Government's efforts; a poultry project was initiated in Ilima and Lubanda villages with financial assistance from *Vétérinaires Sans Frontières* (VSF) - Canada with the goal of raising village chicken production by improving genetic potential through cross breeding of the local chickens with high yielding Rhode Island Red (RIR) chicken breed. The local chicken is slow growing, has low adult body weight, averaging 1 kg for the hen and 1.5 kg for a rooster, and produces an average of 40 to 60 eggs per year (Minga *et al.* 1989; Mwalusanya *et al.* 2001). The RIR chicken on the other hand grows faster, reaches an adult body weight of 2.9 kg for the hen, 3.9 kg for the rooster and produces over 200 eggs per year (Skinner, 1997). The crosses were thus expected to grow faster, achieve a higher adult weight and produce more eggs than the local chicken while adapting easily to the village conditions. The large number of eggs would mean availability of

surplus eggs and chickens for sale and hence increased income and improved livelihoods for the villagers.

The objective of this study was to assess the performance of the local chickens and their crosses under semi-scavenging village husbandry conditions as well as assess farmers' socio economic status and make recommendations for further interventions.

## **METHODOLOGY**

The study was conducted in Ilima and Lubanda villages both of which are in Ilima ward in Rungwe district, Mbeya region in the Southern Highlands Zone (SHZ) of Tanzania. The region is located between latitudes 7° and 9° 31' S and between 32° and 35° E. Rungwe district is bordered by Mbeya district in the north, Ileje in the west, Kyela district in the south and Makete district in the east.

Ilima and Lubanda villages were selected to participate in the project because of high human population density, low soil fertility and low crop yield. The villagers practice subsistence farming and the food they produce lasts 6 months or less each year. The small land size cannot support large scale crop or livestock farming. Almost all households keep local chickens. Thus, chickens were found to be the best option in order to raise their income. A total of 340 out of 600 farmers were given the RIR chickens between the year 2006 and 2008. The selected farmers were required to build a chicken shelter with a run before being given the RIR chickens.

The study was undertaken in 2009, three years after the commencement of the VSF-funded Ilima Poultry Project. The study used a cross sectional survey design because it is cost-effective and less time consuming (Babbie, 1990). The sampling frame comprised households involved in the project. The unit of analysis was the household, which is defined by URT (2003) as a person or group of individuals who live and eat together and share common living arrangements.

A sample was selected as recommended by Boyd *et al.* (1981) and Akitanda (1994). A sample size of 90 households was selected randomly for interview, 60 (30 from each village of Ilima and Lubanda) among the project beneficiaries, and 30 (15 from each village) who were engaged in poultry production but not project participants. Boyd *et al.* (1981) recommend a reasonable representative sample size of at least 5% of a population, but Akitanda (1994) contends that a significant representation can as well be achieved when the sample units constitute at least 30 households from a population under study.

Primary data were collected using a structured questionnaire which was pre tested to check its validity. The data collected included chicken egg production, egg production patterns, nutritional and health management as well as the main constraints and opportunities to chicken and egg production in the area. Secondary data were obtained from relevant documentations available at Uyole Agricultural Research Centre, Uyole Training Institute and Rungwe District Agricultural Office, and Ward Agricultural and Livestock Extension Office (WALEO) as well as information from other sources. The data obtained were coded, summarized, and entered into the statistical package for social sciences (SPSS) computer programme.

Descriptive statistical analysis was done and results presented as simple means, cross tabulations and percentages.

T-test was used to compare mean differences at 95% confidence interval, between the current numbers of chickens with the numbers at the start of the project across all breeds of chickens. The test was also used to compare differences between lost and sold birds, as well as the weekly egg production across the breeds.

## RESULTS

### Respondents' General Characteristics

The household size in the two villages ranged from 1 to 12 with an average size of about 5 members. The mean age of household head was 46.7 years old with a range of 20 to 89 years. In general, farmers in Ilima ward were headed by young (average 46 years) heads of households. The majority of farmers in Ilima village were married (77.8%) a few were widowed (11.1%), and only a small number of them were single (8.9%) or divorced (2.2%). At Lubanda village, 64.4% respondents were married, and 22.3% widowed, 11.1% single and 2.2% divorced (Table 1). The findings indicated that 86.7% farmers in Ilima village had primary education and 13.3% had no formal education while in Lubanda village 75.6% had primary education, 13.3% had secondary education and 11.1% had no formal education (Table 1).

Results also showed that 77.8 % of households in the study area were male-headed while 22.2% were female-headed. Household main sources of income were crop farming (35.3%), with slightly higher income contribution than livestock production which contributed 35.0%, followed by business (17.6%), wages (6.5%) and carpentry (5.6%). The main livestock kept was the chicken.

**Table 1: Household Socio-economic Characteristics in Ilima and Lubanda Villages, Rungwe District, Tanzania**

Response	Villages					
	Ilima		Lubanda		Total	
	N	%	N	%	N	%
<b>Marital status</b>						
Single	4	8.9	5	11.1	9	10.0
Married	35	77.8	29	64.4	64	71.1
Widowed	5	11.1	10	22.3	15	16.7
Divorced	1	2.2	1	2.2	2	2.2
<b>Total</b>	<b>45</b>	<b>100.0</b>	<b>45</b>	<b>100.0</b>	<b>90</b>	<b>100.0</b>
<b>Education level</b>						
None	6	13.3	5	11.1	11	12.2
Primary	39	86.7	34	75.6	73	81.1
Ordinary level sec.	0	0.00	6	13.3	6	6.7
<b>Total</b>	<b>45</b>	<b>100.0</b>	<b>45</b>	<b>100.0</b>	<b>90</b>	<b>100.0</b>

### Chicken Production

The study revealed that 97.7% of interviewed farmers kept chickens. About 89.9% of respondents kept local chicken, 44.9% kept RIR chickens and 22.5% kept cross

breeds. Training on improved chicken management practices was provided to about 10% of the project farmers. Farmers in Ilima ward used chickens for food and as a source of income whereby 16.9% used chicken for income only, 1.2% for food only and 81.9% for both food and income. The amount of money earned from the sale of chickens and eggs ranged from 100/= to 90,000/= TAS with a mean of 11,777.55/= TAS per month.

Apart from selling, chickens and eggs were consumed as well. Households with more than one laying hen consumed between 2 to 21 eggs per week. The number of eggs consumed depended on availability of eggs in a household. The households with many laying hens at a particular time consumed more eggs than those with few laying hens.

Households started with a minimum of one RIR rooster or hen per household and a maximum of 15 roosters, and 15 local chickens after which the number grew to a maximum of 20 crosses and 30 local chickens (Table 2). Some households had no RIR because their chickens died while others owned up to 5 RIR chickens. The households with more than one RIR obtained them through buying from other farmers. The number of crossbred chickens had increased from 73 to 125 indicating good performance among the local x RIR chicken crosses among project participants. There was no significant difference between the number of chickens the farmers started with and the number of chickens at the time of the study for the RIR and cross breeds at 95% confidence interval while the difference was highly significant ( $P < 0.000$ ) for local chickens (Table 2). The mean value of local breed lost was significantly higher ( $P < 0.032$ ) than other breeds, while there was no significant difference ( $P < 0.500$ ) between the mean number of birds sold amongst the breeds.

When the number of chickens were (started and at time of the study) tested for difference using the paired T-test, the results showed no significant difference between RIR and cross breeds at 95% confidence interval while the difference was highly significant between RIR and local breeds ( $P < 0.000$ ) (Table 2). Loss of birds due to various causes reduced the number of chickens in a household. When tested for difference using one sample T-test results showed that the mean number of local chickens lost is higher than other breeds ( $P < 0.032$ ) while the mean number of birds sold was not significantly different between the breeds ( $P < 0.500$ ). The crosses owned by non project participants decreased from 8 to 3 per household. Respondents pointed out that death of chicks contributed most to chicken losses.

### **Chicken Ownership and Responsibilities**

Regardless of breed type, chickens were owned by men (43.6% households), women (54.9% households) and children (1.5%). Men (39.9%) were the main group responsible in chicken management followed by women (28.2%). Boys (12.5%) and girls (11.0%) played relatively smaller role in chicken management in both villages (Table 3).

**Table 2: Chicken Numbers in Project Households in Ilima and Lubanda Villages, Rungwe District, Tanzania**

	No. of respondents	Minimum	Maximum	Standard Deviation
<b>Number of chickens per household at the start of the project</b>				
RIR	49	1.00	1.00	0.00000
Cross bred	20	1.00	15.00	3.80408
Local	70	1.00	15.00	2.46671
<b>Number of chickens per household two years after the start of the project</b>				
RIR	30	0.00	5.00	1.31700
Cross breed	19	2.00	22.00	5.66512
Local	70	1.00	30.00	6.05648
<b>Number of chickens lost per household per year</b>				
RIR	16	1.00	18.00	4.30068
Crosses	11	1.00	15.00	4.09878
Local	42	1.00	100.00	15.74656
<b>Number of chicken sold per household per year</b>				
RIR	1	3.00	3.00	
Crosses	3	2.00	100.00	55.73449
Local	27	1.00	93.00	17.88241

**Table 3: Responsibility in Chicken Management in Ilima and Lubanda Villages, Rungwe District, Tanzania**

Responsible	Percentage of respondents Villages		
	Ilima (n = 131)	Lubanda (n = 142)	Total (n = 273)
Men	18.7	21.2	39.9
Women	15.4	12.8	28.2
Boys	4.4	8.1	12.5
Girls	5.9	5.1	11.0
Both boys and girls	1.1	2.6	3.7
Both Men and women	2.6	2.2	4.8
<b>Total</b>	<b>48.0</b>	<b>52.0</b>	<b>100.0</b>

Chicken management activities included shelter construction, feeding, vaccination and cleaning and these were performed mainly by men (head of the household) (39.9%) and women (28.2%). Boys and girls played relatively minor roles in the management of chickens (12.5% and 11.0% respectively).

Free range and semi-intensive systems of chicken rearing were practiced by 62.1% and 34.4% respondents, respectively and only 3.5% practiced intensive husbandry system. Supplementary feeds given to chickens included cotton seed cake, minerals, sardines, cassava, maize and rice bran. Maize and rice bran were provided by 62.6% of the farmers (Table 4) and water was given ad libitum. Distinction between basal

and supplementary feeds was not clear to farmers. Similarly, they could not recollect the different proportions of maize bran and rice bran given. Farmers used different types of chicken houses. Whereas 60% of the respondents had separate chicken shelters, 40% of respondents however did not have any specific houses for chickens instead they housed them in the kitchen or other rooms of the family house during the night.

**Table 4: Type of Feed Offered to Chicken in Ilima and Lubanda Villages, Rungwe District, Tanzania**

<b>Feed type</b>	<b>Number of respondents</b>	<b>Percent</b>
<b>Basal feed</b>		
Free range	54	64.3
Maize/Rice Bran + water	27	32.1
Maize/Rice Bran + kitchen left overs	2	2.4
Kitchen left overs	1	1.2
<b>Total</b>	<b>84</b>	<b>100.0</b>
<b>Supplementary feed</b>		
Maize/rice bran	57	62.6
Cassava	3	3.3
Sardines	20	22
Minerals	2	2.2
Cotton seed cake	9	9
<b>Total</b>	<b>91</b>	<b>100</b>

#### **Health management and disease control**

About 70.6% of respondents vaccinated their chickens while 29.4% did not vaccinate as they lacked the service (80%) or were ignorant and/or negligent (20%). The diseases reported to be immunized against was mainly Newcastle disease (98.2% of respondents) and other diseases especially fowl pox (1.8%).

#### **Type of Breeding**

Crossbreeding was between local and RIR breeds and among local chicken types. Although each household that participated in the project was given one RIR, random breeding of RIR roosters and RIR hens with local hens and roosters from non-participating households took place, since chickens were left free to roam from one household to another during day time.

#### **Egg Production, Incubation and Hatchability**

The average number of eggs produced per week varied depending on the chicken breed. A maximum of 7 eggs were laid per week from both chicken breeds with an average of 6.3 per week from RIR, 5.9 from crosses and 5.2 from local chickens when in lay. When the mean number of eggs produced per week for different breeds was tested for difference using one sample T-test the results showed no significant difference ( $P < 0.405$ ) between RIR and cross breeds for mean number of eggs produced per week, while there was a significant difference ( $P < 0.050$ ) between the RIR and local breed for the mean number of eggs produced per week.

Crosses of RIR x local chickens in the study area laid up to 108 eggs per year and local chickens laid up to 60 eggs per year. Brooding was done solely by local hens. The mean hatchability was 87.7% for local chickens, 71.7% for crosses and 40.8% for RIR (Table 5). When the mean hatchability was subjected to one sample T-test, results showed highly significant difference between local and other breeds ( $P<0.000$ ) and when further compared among crosses and RIR, the results showed highly significant level of difference as well ( $P<0.001$ ).

**Table 5: Egg Production and Hatchability in Ilima and Lubanda Villages, Rungwe District, Tanzania**

Type of breed	N	No. of eggs laid per week			Std. Deviation
		Minimum	Maximum	Mean	
RIR	6	5	7	6.3	1.03
Cross	19	4	7	6.0	1.13
Local	67	2	7	5.3	1.36
<b>Hatchability (%)</b>					
RIR	6	0.0	100.0	40.8	45.87
Cross	16	4.0	100.0	71.2	29.67
Local	64	10.0	100.0	87.7	18.08

#### **Constraints In Chicken Production**

The main production constraints in the study area (Table 6) were infectious diseases and parasites (39.1%), followed by unavailability of feeds during the dry season (20.1%).

**Table 6: Chicken Production Constraints in Ilima and Lubanda Villages, Rungwe District, Tanzania**

Chicken production constraints	Percentage (%)
Infectious diseases and parasites	39.1
Unavailability of feeds in dry season	20.1
Theft	13.0
Lack of production skills	7.6
Predators	14.1
Lack of capital	6.0
<b>Total</b>	<b>100.0</b>

Diseases, mainly Newcastle disease, were the leading causes of chicken loss (38.5%) followed by predators (eagles and dogs) (35.7%), accidents (16.4%) and least loss was due to theft (9.4%). An average of 16 chickens per household was lost per year due to diseases, predators (eagles and dogs), accident or theft.

Suggestions by farmers on how to improve chicken production and productivity were availability of veterinary services (31.1%), training on chicken management



(20.0%), availability of extension workers in the villages (18.4%), construction and use of shelter (17.4%), availability of credit facilities (10.5%) and formation of chicken farmers' association (2.6%).

## **DISCUSSION**

Demographic data are useful in gauging the social and economic welfare of a society. Social and economic characteristics have effects on farmers' production decisions and resource allocation. They determine human potential to produce and capacity to change production practices and technology in ever-changing social and economic environment (Ngailo *et al.*, *et al.*, 1993).

The average household size in the two villages of Ilima and Lubanda was 5 members. This is similar to the average family of 5.1 reported for rural Tanzania (HDC, 2012). It is also similar to the household size of 5 reported from rural India but differs from household size of 2.3 reported for urban areas of India. According to Kamuzora and Mkanta (2000), a large family is an advantage for households which depend solely on agriculture as a source of income, because agriculture is labour-intensive and hence is dependent on the size of the labour force. In the more advanced economies, family size is not a determinant of the economic welfare of a household.

In Tanzania, the percentage of married adults is 60.6 while widows are 5.6 and divorced are 4.8 which means that people in Ilima and Lubanda had a higher percentage of married couples (71.1%) compared to the national average and that fewer are divorced (2.2%) than the national average but a lot more were widowed (16.7%) than the national average (TNBS, 2004/2005). This means that marriages are relatively more stable in the study areas than the national average but that the high percentage of widows may mean that death rate of adults is higher in those two villages than the national average. Female headed households were not common in the study area and occurred due to either being single, widowed or divorced but not as a result of matrilineal system since the society in the study area appeared to be wholly patrilineal.

With majority of people in the study villages having formal education and literate (87%) and only 12.2% were without formal education and illiterate, and hence the literacy rate in Ilima and Lubanda was higher than the national average of 84% (TNBS, 2004/20005). With such high literacy rate, it was expected that the farmers would be knowledgeable about chicken husbandry and hence raise their chickens using more improved husbandry practices. The constraint could be that the extension materials were not availed to the farmers.

The percentages of male-headed households (77.8%) and female-headed (22.2%) households in this study were the same as the national figures of 22% and 78% for female-headed and male-headed households respectively. The female-headed households were not by design but rather a result of the women being single, widowed or divorced.

Chicken ownership being mainly by women (54.9%) in most households was expected since it is considered a small livestock compared to cattle, sheep or goats. It was noted, however, that in a substantial number of households (43.6%), it was the men who owned chickens which means that chickens are highly valued in the study area. This observation is in agreement with the findings that management of chickens was almost equally shared between husbands and wives. The role of children was also substantial which is impressive since they are expected to be the future chicken farmers.

The observed income from agricultural activities i.e. crop farming and livestock income combined in the current study was 70.3% of the total income which is higher than the national average of 60.4% (HBS, 2000/2001). However, income from business was similar to the national average of 17.8% but higher than the national average if business was to include carpentry hence a total of 24.2%. This may mean that the villagers were more enterprising than the average Tanzanians living in rural areas. This may be explained by the fact that the two villages are along Tukuyu – Kyela trunk road and hence are expected to have easier access to market than if they were located in remote areas.

The average income (11,777.55) per month from sale of chickens was a relatively good monthly income if one was to compare with the average household monthly income of Shs. 14,134 which is inclusive of income from all possible sources reported for Tanzania (HBS, 2005). This can be interpreted to mean that income from chicken is relatively substantial and that chicken keeping did contribute to poverty alleviation. The fact that 97.7% of the villagers kept chickens for food and or for sale mean that the majority of the villagers benefit from chicken keeping activities. These findings imply that crop and livestock farming especially chicken in household are more important than other income sources. The monthly income of Shs. 11,777/55 is about USD 7.55 which is very small. The income from chicken was 35% of all incomes which means that the monthly income from all income generation activities per household is USD 21.57 or USD 4.31 per person per month or USD 0.14 person per day which is far below the poverty line of USD 1 per person per day. However, this has not included the monetary value of the food including cereals, chickens and eggs which a household grows and raises and is eaten by members of the household. If these were to be factored in, the total income would be higher than income of sales of chicken and eggs and other sources but not above the poverty line.

Chickens in two thirds of the households were on free range, one third were kept semi-intensively and just in a few households were the chickens raised intensively. Two thirds of the households had separate houses for their chickens as night shelters while one third of chickens were kept in kitchens and in the living houses. In a majority of households, supplementary feeds were supplied. It was noted, however, that during the dry season, there was shortage of feeds for chickens, green vegetation was limited and that supplementation in terms of maize and rice bran was also limited. This was the time when productivity declined, there was slowed growth and lowered egg production.

Findings from this study showed that the weekly egg production was highest among RIR hens (6.3), followed by the crosses (5.9) and lastly, the local hens (5.2) when in lay and the difference in egg production between the local hens and the former two was statistically significant. The mean hatchability of eggs was lowest for RIR eggs and highest for the local chicken while that of the crosses was intermediate and that the differences were significant. The differences in egg production was expected since RIR have been selected for their high genetic production potential in terms of eggs and meat whereas, in Tanzania, the local chickens have never been selected for such a trait. According to literature, local chickens can lay 50 – 60 eggs per year with an average of 4 clutches per annum, while the cross breed chicken can lay up to 120 eggs with the average of 6 clutches per year while pure RIR chickens can lay up to 200 eggs per year (Minga *et al.*, 1989; Skinner, 1997; Mwalusanya *et al.*, 2001). This was very similar to productivity levels what were found in the study villages.

The finding that there was greater loss of local chickens than the RIRs and crosses was not expected since it is assumed that local chickens are hardier than the RIR or their crosses. One explanation might be that the villagers took greater care of the newly introduced RIR and the crosses than the local chickens and that the majority of respondents used improved chicken management practices introduced by the project to raise their chickens. The number of local chickens had increased among both project and non project participants indicating that local chickens tolerate a wide range of management conditions and that there was a spillover effect on improved management practices from the project to non-project farmers.

It was noted from this study that greatest loss was among chicks. This was expected and it is known that over 50% of chicks are lost before reaching maturity and that chicken losses decline upon reaching maturity (Minga *et al.*, 1989; Mwalusanya *et al.*, 2001; Moges *et al.*, 2010). Chicken losses were due to diseases, predators, accidents and theft in that order of importance. Of the diseases, Newcastle disease was the number one killer and this has been reported before in Tanzania (Yongolo *et al.*, 1998) especially if chickens were not vaccinated against the disease. However, this was not expected in Ilima and Lubanda since the majority of the farmers claimed to have vaccinated their chickens against Newcastle disease. It could be that vaccination was not properly done or the vaccine was defective.

Chicken production in Ilima ward as in other villages in developing countries, is a common phenomenon with benefits such as source of income and food (Kitalyi, 1998). However, it is still associated with a lot of production constraints. The villagers identified a number of constraints which hindered improved chicken production, chief among which were infectious diseases and parasites, followed by shortage of feeds, predators, theft, lack of production and health management skills and capital. In order to overcome the constraints, farmers were of the opinion that they needed extension services, including veterinary services and also training in chicken husbandry skills. They felt that there was also need for them to form a chicken farmers' association.

In order to improve chicken production, farmers ranked veterinary services as the highest intervention that would improve chicken production. This is a reflection of

their concern on diseases as the major constraint to chicken production. Training in chicken management skills was ranked as number two which means that they did realize that they lacked the skills for improved chicken husbandry. It is surprising that need for credit and formation of farmers' associations was ranked the lowest. The observation may be due to lack of awareness on the benefits of capital and farmers groups. There is, thus, a need to sensitize farmers about these two if they want to reap maximum benefits from chicken farming.

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