



Household baseline data in Tanzania:  
Monitoring delivery of chicken  
genetic gains



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# Household baseline data in Tanzania: Monitoring delivery of chicken genetic gains

African Chicken Genetic Gains: A platform for testing, delivering and continuously improving tropically-adapted chickens for productivity growth in sub-Saharan Africa

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# Contents

Tables	v
Figures	vi
Acknowledgements	vii
Acronyms	viii
Executive summary	ix
1. Introduction	1
2. Study areas, methodology and sources of the data	3
2.2 Data collection	4
2.3 Data analysis	4
3. Results and discussion	5
3.1 Characteristics of the household head	5
3.2 Livelihood analysis	6
3.3 Food security	11
3.4 Chicken production, purposes and objectives of keeping chicken	14
3.5 Chicken labour allocations	18
3.6 Chicken marketing	19
4. Constraints and opportunities	21
5. Conclusion	22
References	23

# Tables

Table 1: Household basic characteristics in Tanzania (2015–16)	5
Table 2: Quarterly average household income in Tanzania (2015–16)	7
Table 3: Household main source of livelihood in Tanzania (2015–16)	7
Table 4: Livestock asset ownership in TLUs in Tanzania (2015–16)	8
Table 5: Ownership of livestock by gender disaggregated in Tanzania (2015–16)	8
Table 6: Household and domestic assets ownership index in Tanzania (2015–16)	10
Table 7: Adequate food provisioning in the last 12 months in Tanzania (2015–16)	11
Table 8: IDDS in Tanzania (2015–16)	12
Table 9: FCS in Tanzania (2015–16)	13
Table 10: Chicken and egg consumption (numbers consumed in the last three months) in Tanzania (2015–16)	13
Table 11: Mean duration of chicken-keeping experience by households in years in Tanzania by subnational zone (2015–2016)	14
Table 12: Flock size per household in the different subnational zones in Tanzania (2015–16)	14
Table 13: Ranking of chicken production purposes and objectives by households in different subnational zones in Tanzania (2015–16)	15
Table 14: Attributes/qualities of good cockerels and hens in Tanzania (2015–16)	17
Table 15: Chicken labour allocation (minutes in the last one week) in Tanzania (2015–16)	18
Table 16: Marketing of chicken (last three months) in Tanzania (2015–16)	19
Table 17: Egg marketing (per week) in Tanzania (2015–16)	20

## Figures

Figure 1: The subnational zones and districts sampled in the ACGG baseline study in Tanzania (2015–16).	3
Figure 2: The proportion of female- and male-headed chicken-keeping households in Tanzania by subnational zone (2015–16)	6
Figure 3: Farmers housing conditions in Tanzania (2015–16).	11
Figure 4: Chicken-flock composition per household in different subnational zones in Tanzania (2015–16).	15
Figure 5: Chicken-breed preferences by farm households in Tanzania (2015–16).	16
Figure 6: Household reasons for breed preferences in Tanzania (2015–16).	16
Figure 7: Existing practice of provision of supplementary feed for chickens in Tanzania (2015–16).	18
Figure 8: Household reasons for selling chickens in Tanzania (2015–16).	19
Figure 9: Role of gender in selling chicken in Tanzania (2015–16).	20

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# Acronyms

ACGG	African Chicken Genetic Gains
BMGF	Bill & Melinda Gates Foundation
CHI	Cashpor Housing Index
FCS	Food consumption score
GDP	Gross domestic product
HDDS	Household dietary diversity score
IDDS	Individual dietary diversity score
ILRI	International Livestock Research Institute
ODK	Open Data Kit
TLU	Tropical livestock unit
TZS	Tanzanian shilling

# Executive summary

This summary presents the main results of the ACGG baseline survey data in Tanzania. The survey was conducted in 80 rural villages of the country. The study villages were selected randomly from the long list of villages in each cluster of villages in central semi-arid, eastern subhumid, southern highlands, lake zone and southern humid, called subnational zones in the project. The subnational zones represent different agro-ecologies in the country. The cross-sectional baseline study covered a total of 1,257 households. Following the description of the survey design and tools<sup>1</sup>, the study presents the main findings in the form of cross-tabulation, rank-index, tables and graphs.

The study found that only 239 (20.6%) of the sample households were female-headed. For the entire sample, the average number of years of schooling, family size and age of the household head is 6.9, 5.2 and 47.8, respectively. The mean chicken-flock size per household is 27 chickens. The flock structure and composition are dominated by chicks followed by hens. Almost all households—94%—in the study have experience of providing supplementary feeding (i.e. any feed that was not scavenged) to their chickens at some time of the year. Good physical appearance, large body size and less illness are the most important traits in choosing cockerels. For hens, the production of more eggs is the most important trait identified by the households. The results of the study indicate that chickens are kept for multiple purposes and objectives with meat consumption and live-adult chicken sale rated the highest.

The average quarterly household income from all sources is sizably lower in eastern subhumid and highest in the lake zone. Households in eastern subhumid reported a mean quarterly income of 237,803 Tanzanian shillings (TZS), while TZS476,890 was reported in the lake zone. Overall, the average quarterly income of households from all sources is TZS352,654. The contribution of poultry income to the total household income is 38.35%. In terms of sources of livelihoods, 79% of households stated that crop farming was their major source of livelihood; livestock keeping was the second most named as the main source of livelihood and poultry keeping was the third most important source of livelihood. Regarding gender disaggregated ownership of all livestock species, across the subnational zones, the most common livestock ownership pattern is joint ownership between the head and spouse compared to individual ownership by men or women. Compared to women, men own more farm and household assets, although joint ownership is significantly higher than individually owned assets. For the entire sample, livestock contributes an average of 15.58% to the households' asset index.

Across the subnational zones, of the total sampled households, 98%, 91%, 91%, 85% and 79% of the respondents in southern humid, lake zone, southern highlands, eastern subhumid and central semi-arid, respectively, reported that they had enough food in the last 12 months. Overall, 89% of the sample respondents reported that they had adequate food in the last 12 months for their household. Most households in the project subnational zones have acceptable food consumption scores (FCS) of more than 35. An FCS range of between 21.5 and 35 is borderline while any number below 21 constitutes a poor FCS. Across the subnational zones, the individual dietary diversity score (IDDS) is relatively higher for index children than men and women.

Chicken and egg consumption in the three months before the survey was highest in the lake zone and lowest in the southern highlands subnational zones. On average, households in the lake zone consumed 4.3 birds per three months while in the southern highlands, the number is 2.0 birds per three months. Central semi-arid rates second highest in bird

<sup>1</sup> <http://acgg.wikispaces.com/file/view/Final%20ACGG%20Framework%20Site%20Selection28Dec15.pdf/571135015/Final%20ACGG%20Framework%20Site%20Selection28Dec15.pdf>

consumption where on average, households consumed 3.3 birds per three months. The average household consumption across the subnational zones is 3.0 birds per three months. Egg consumption is high in the southern highlands, 19.2 eggs per three months, and low in the lake zone, 8 eggs per three months. Across the subnational zones, the average egg consumption is 14.6 eggs per three months.

The data collected on labour allocation for chicken activities by different household members indicates that on average, adult women spend 138 minutes in a week on chicken activities (about 20 minutes per day). Next to women, adult men spend more time than children and hired labour on chicken activities (seven minutes per day). More than half of the sample households—54%—reported that the money accrued from sale of chicken was used to cover household basic needs. The information generated from the baseline survey informed the design and implementation of the longitudinal (on-farm) study. It is also our intent that the information presented in this report can support future chicken research and development activities. In addition, the procedures followed and the baseline tools developed can be adapted for similar purposes outside of ACGG subnational areas. Finally, the data provides a useful reference to study similar cases.

**Keywords:** Chicken; Tanzania; subnational zones; African Chicken Genetic Gains; longitudinal study

# I. Introduction

Poultry is broadly recognized as the livestock of poor people and poultry production is part of most smallholder-farming systems (Guèye 2005; Sonaiya 2007). Kryger et al. (2010) indicated that in sub-Saharan Africa, 85% of the rural households keep chickens or other types of poultry as supplementary to main livelihood activities.

The role of poultry as a potential income source for the poor has frequently been cited (Guèye 2005; Hailemichael et al. 2016; Sonaiya 2007). According to Sonaiya (2007), the importance of poultry in assisting the landless poor and the destitute is reflected in many national poverty reduction strategy programs. In most African countries, family poultry has been recognized as one of the key entry points to accomplishing the millennium development goal of reducing the number of poor and needy people (Sonaiya 2007). Almost all families at the village level in most developing countries, including the landless and poor, are owners of poultry. However, low-cost technology is needed to substantially improve production (Nduthu 2015; Upton 2004).

In both rural and urban areas in Tanzania, the poultry sector plays a significant role in terms of food security, source of income, and meeting economic and social obligations for the household, especially for poor families (Buza and Mwamuhehe 2001). In addition to slaughtering for home consumption, chickens are sold to raise money for the purchase of household basic needs such as food, medicine, clothes and payment of school fees, farm implements and fertilizers (Buza and Mwamuhehe 2001). In Tanzania, chickens contribute to about 16% of livestock gross domestic product (GDP), 3% to agricultural GDP and 1% to the national GDP, which is significant for the national economy (Komwihangilo 2015). However, there are many factors that hinder productivity and performance of village chickens, which in turn affects its contribution to increasing the income and food security status of the smallholder chicken-keeping households in Tanzania.

## Past attempts at improvement and lessons in Tanzania

There are 3,017,004 smallholder households in Tanzania (2,950,268 on the mainland and 66,736 in Zanzibar); 62% of these households keep chickens, predominantly indigenous chicken (Bureau of Statistics et al. 2002–03). In the villages of Tanzania, the husbandry practised is unimproved and traditional and there is no deliberate effort to improve the chicken genetically (Msami 2008). There is little incentive for farmers to improve village chicken husbandry in Tanzania because frequent outbreaks of Newcastle disease cause total or partial extermination of the flocks. Although local breeds are well adapted to the harsh living conditions of scavenging, they are not the optimal chicken breed in terms of production. Better suited breeds can improve survival rate, weight gain, number of eggs and fertility of the chicken stock (Kisungwe et al. 2010). The ACGG chicken performance testing and long-term genetic gains program endeavours to make chicken rearing in Tanzania a profitable business for rural households. To achieve this goal, the project nurtures public-private partnership and facilitates access to better breeds and poultry health services by farmers

According to Röling (1988), the development and transfer of appropriate technologies should be a function of the farmers' socio-economic and management practices at the field level. Thus, generating baseline data/information on the current smallholder chicken production systems, flock sizes, ecotypes kept, current productivity level and other socio-economic conditions of poor smallholder chicken farmers in sub-Saharan Africa is of paramount importance. Moreover, a better understanding of the rationale underlying smallholders' objectives for keeping chickens and use patterns of chicken and

chicken products is necessary to guide research and development programs supporting village chicken producers through focusing on flock performance and traits of importance to meet smallholders' production objectives.

The ACGG program conducted a baseline survey in 2015–2016 across ACGG countries (i.e. Nigeria, Tanzania and Ethiopia) to understand, define and characterize the current smallholder chicken production systems, ecotypes, productivity, husbandry practices, farmer production objectives and the socio-economic status of poor chicken-producing smallholder farmers. A preliminary analysis was undertaken on the baseline data and this report was developed to analyse the constraints relating and opportunities for the sustainable improvement of chicken production under smallholder systems in the diverse agro-ecological zones, and identify potential areas of improvement that will inform the design and implementation of the longitudinal study, as well as to later evaluate the impact of the project.

## 2. Study areas, methodology and sources of the data

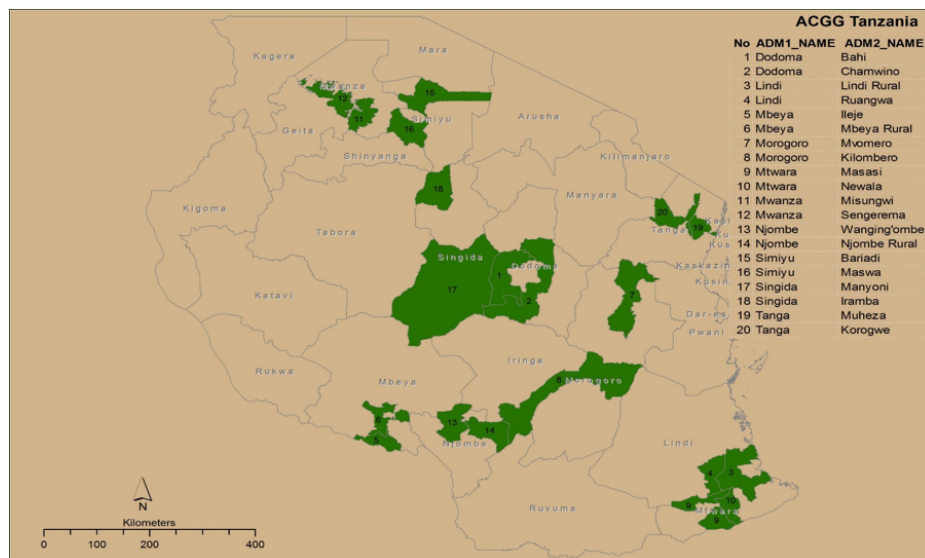
### 2.1 Study design

#### Study site selection and sampling methods

In Tanzania, the ACGG project baseline survey was conducted in 80 rural villages of the country. The study villages are located in central semi-arid, eastern subhumid, southern highlands, lake zone and southern humid, called subnational zones in the project. The subnational zones represent the chicken production environments in Tanzania (Figure 1). For this study, the selection of the subnational zones and districts was purposively based upon the presence of a high number of chickens in the sampling unit, the higher number of smallholder households rearing chickens, per cent contribution of chicken to household income and diets, per cent of market share captured by smallholder producers, availability of feed for a growing chicken industry and finally, a diversity of agro-ecological zones.

In each subnational zone, 16 villages were selected. Thus, the total number villages selected for the baseline study was 80. The ACGG baseline project villages were selected as follows: first, a cluster of villages was selected within districts; secondly, villages were selected randomly from the long list of villages in each cluster of villages. From the selected subnational zones and districts, a total of 1,202 chicken-keeping households with at least two years of chicken-keeping experience were randomly selected for the baseline, and all selected households were provided with informed consent. However, due to response errors which may occur when respondents provide inaccurate information, and errors due to nonresponse when the respondents did not provide the required information or the information they provided is unusable, 42 households which accounts for 3.49% of the sample households were invalid for the analysis. Therefore, the results of this study are based on the analysis of the data collected from a cross-sectional baseline survey of 1,160 households in Tanzania.

Figure 1: The subnational zones and districts sampled in the ACGG baseline study in Tanzania (2015–16).



## 2.2 Data collection

The essential purpose of any agro-sociological survey is to gather basic first-hand information with regard to farmers' circumstances and production practices. To this end, a structured questionnaire survey tool was developed, tested and implemented using the Open Data Kit (ODK) data collection system. Prior to the commencement of the baseline survey, training was provided for survey coordinators, supervisors and enumerators of each subnational zone. Over seven days, the training consisted of education in the classroom, and group and field exercises. The training covered the objectives of the project and the training itself, careful examination and review of each module in the questionnaire, careful understanding of the ODK system to collect data using the tablets, and interviewing techniques.

The classroom education focused on familiarizing the survey coordinators, supervisors and enumerators with the content of the questionnaire followed by a role-play training approach where one of the group members played the part of the household and was interviewed by another member of the group. Moreover, classroom training was given on how to use the tablets and ODK for the data collection, and how to load the questionnaire in the tablets followed by a role play using the tablets. In the field exercise, supervisors and enumerators were taken to nearby villages to practise interviewing, and pretesting increased enumerators' understanding level and helped to evaluate the survey tool itself. Regarding interviewing techniques, supervisors and enumerators were taught about neutrality, probing techniques, how to approach reluctant respondents and how to approach politely and respect the households' answers. On the last day of the training, feedback was collected, the pre-test was reviewed and discussed, any issues in the questionnaire were identified and tool changes were made and finalized as required.

## 2.3 Data analysis

The data collected for the baseline study included, among others,<sup>2</sup> household characteristics, chicken production, chicken inventory, chicken entries and exits, chicken marketing, chicken productivity, trait preferences, selection criteria of farm households, chicken management (chicken housing, feeding and health management), labour allocations for chicken activities, food security and consumption, and institutional and other support services. The data were analysed using STATA 14. Cross-tabulations, indices and other descriptive methods of analysis were used where appropriate.

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<sup>2</sup> Because of lack of gender disaggregated data, the chicken data is presented only at the household level.

## 3. Results and discussion

### 3.1 Characteristics of the household head

#### Respondents' education level, age and family size

Table 1 presents the basic characteristics of the sample household heads in the project subnational zones. The information includes number of years of schooling, the age of the household heads in years and family size of the household heads. The results of the study reveal that the average number of years of schooling of the household heads has some variation across the subnational zones. In general, eastern subhumid households had attained a better education level than other subnational zones. Household heads in central semi-arid and the lake zone had very low education level attainment compared to the other subnational zones. For the entire sample, the average number of years of schooling was 6.9 (Table 1).

The results presented in Table 1 indicate that the average age of the sample household heads varied. On average, household heads in eastern subhumid are older than in the other subnational zones. The average age of household heads in eastern subhumid is 49.4 years. For the entire sample of households across the subnational zones, the average age of the household heads is 47.8 years. Family size of the household heads was also addressed in this study and the results show that family size was lowest in southern humid with an average family size of 4.1 and highest in the lake zone with an average number of 6.9. Across the subnational zones, the average household size is 5.2 members.

Table 1: Household basic characteristics in Tanzania (2015–16)

Subnational zones	Variables	Mean	Number of observation
Central semi-arid	Family size	5.7 (2.5)	237
	Age in years	48.6 (13.3)	237
	Number of years of schooling	6.6 (3.3)	237
Eastern subhumid	Family size	5.0 (1.9)	222
	Age in years	49.4 (17.1)	222
	Number of years of schooling	7.9 (3.3)	222
Southern highlands	Family size	4.2 (1.6)	217
	Age in years	46.3 (20.1)	217
	Number of years of schooling	6.7 (3.2)	217
Lake zone	Family size	6.9 (3.0)	221
	Age in years	48.0 (14.2)	221
	Number of years of schooling	6.6 (3.5)	221
Southern humid	Family size	4.1 (1.4)	234
	Age in years	46.9 (15.8)	234
	Number of years of schooling	6.9 (2.5)	234
Total	Family size	5.24 (2.4)	1,131
	Age in years	47.8 (16.2)	1,131
	Number of years of schooling	6.9 (3.2)	1,131

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

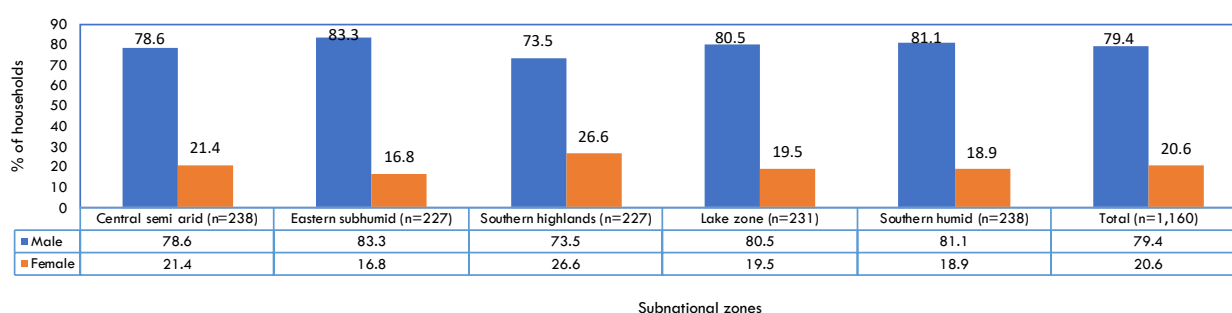


## Gender composition of the household heads

Gender is one of the major variables addressed in the project and used in the analysis. The results of the study reveal that the majority of the household heads in the eastern subhumid zone are male (83.3%), with having the lowest number of female-headed households (16.8%). The distribution of household heads is similar across all the subnational zones surveyed; the proportion of female-headed households is very small, which has implications in decision-making and ownership of chickens. The percentage of female-headed households is highest—26.6%—in the southern highlands subnational zone (Figure 2).

Overall, about 79.4% of the households covered in the baseline survey were male-headed households while only 20.6% of the households in the survey are female-headed. The results flagged the potential of engaging women in the project. Therefore, for the on-farm study, the householder was adopted instead of the household head, where a householder is the person who devotes the most time to chicken production activities. In many cases, this will not be the household head.

Figure 2: The proportion of female- and male-headed chicken-keeping households in Tanzania by subnational zone (2015–16).



Source: Household baseline survey 2015–16

## 3.2 Livelihood analysis

In this section of the report, the different components of the livelihood analysis are provided. Based on the existing institutional management, institutional setup and the agro-ecological situations, households adopted strategies and behavioural choices to achieve their livelihood objectives. This section of the report primarily includes the different capital of households (physical and financial) across the different subnational zones. Most importantly, the results focus on household income, source of livelihood, asset ownership, in particular, livestock ownership, and farm and domestic asset ownership using the household asset index specifically to determine the contribution of livestock to the household. In addition, we report food security indicators based on the procedure recommended by a gender, livestock and livelihood indicators report (Njuki et al. 2011) by adopting the Food and Agriculture Organization 2011 guidelines for measuring household and individual dietary diversity.

### Household income

Average total household income from all sources, income obtained from poultry, the contribution of poultry income to total household income and women's control of household income are presented in Table 2. Quarterly average income of the different subnational zones is also reported in Table 2. The results indicate that the average income varies across the project subnational zones. Total household income from all sources is considerably lower in eastern subhumid at TZS237,803 and highest in the lake zone at TZS476,890. Households in eastern subhumid reported a mean quarterly income of TZS237,803 and TZS476,890 in the lake zone. Overall average quarterly income of households from all sources is TZS352,654.

In the project areas, it is a common practice that households engage in poultry production activities. The data analysis results indicate that in all subnational zones, income from poultry makes an important contribution to the average household income. This contribution is more important in the eastern subhumid subnational zone—59% of total income—than in the other subnational zones. Across the five sampled zones, the overall contribution of poultry income to the total

household income is 38.35%. Women's control of household income is significantly low; out of the total households (1,160) only 20.48% of women controlled their income from at least one source (Table 2).

Table 2: Quarterly average household income in Tanzania (2015–16)

Income	Subnational zones					
	Central semi-arid n=238	Eastern subhumid n=227	Southern highlands n=226	Lake zone n=231	Southern humid n=238	Total n=1,160
Income from poultry	81,745.10 (204,380.00)	92,736.90 (254,922.00)	75,678.57 (124,766.60)	53,875.70 (92,918.50)	83,081.30 (121,761.00)	77,674.64 (173,010.40)
Total household income	327,036.00 (466,987.00)	237,803.00 (486,855.00)	362,955.10 (605,580.00)	476,890.00 (1.16e+06)	368,613.00 (1.35e+06)	352,654.40 (869,932.70)
Poultry/total income (%)	28.32	59.00	35.59	20.61	50.65	38.35
Women* control household income (%)	25.53	22.80	19.10	19.25	14.29	20.48

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

\*This refers to the proportion of households where women control income from at least one source. This excludes joint control.

## Sources of livelihood

Sample households were asked to identify and prioritize the three most important (primary, secondary and tertiary) sources of their livelihoods. The results presented in Table 3 indicate that households in the study subnational zones derived their livelihoods from many different sources. For the entire sample, 79% of households declared that crop farming or production was their major source of livelihood; livestock keeping was the second most named as the main source of livelihood and poultry keeping is the third most important source of livelihood. This clearly indicates that livestock and poultry production are very important in the economic strategies of most rural farm households. Simple reliance on crop farming seems necessary but not sufficient to sustain farming households; livestock production and poultry keeping are important additional contributors to household income. The results also clearly indicate that most of the sample households have mixed-farming systems, integrating crop production with livestock rearing. Other livelihood sources include livestock trading, formal salary employment, livestock herder, self-employed and working as a daily wage labourer, but the contribution of these activities to household income is insignificant (Table 3).

Table 3: Household main source of livelihood in Tanzania (2015–16)

Sources of livelihood	Rank of livelihood		
	Primary	Secondary	Tertiary
Crop farming	894 (79.0)	121 (14.8)	16 (4.9)
Livestock keeping	32 (2.8)	198 (24.3)	46 (14.1)
Poultry keeping	39 (3.4)	304 (37.3)	150 (45.9)
Livestock and livestock product trading	1 (0.1)	13 (1.6)	2 (0.6)
Trading in nonlivestock agricultural products	12 (1.1)	17 (2.1)	8 (2.4)
Formal salaried employment	48 (4.2)	10 (1.2)	1 (0.3)
Livestock herder	3 (0.3)	5 (0.6)	8 (2.4)
Self-employed trade	26 (2.3)	47 (5.8)	29 (8.9)
Self-employed services	38 (3.4)	44 (5.4)	22 (6.7)
Farm labourer	2 (0.2)	15 (1.8)	6 (1.8)
Fishing	1 (0.1)	1 (0.1)	0 (0)
Old/retired	24 (2.1)	4 (0.5)	7 (2.1)
Domestic work—own home	0 (0)	15 (1.8)	22 (6.7)
Not working/unemployed	1 (0.1)	7 (0.9)	2 (0.6)
Infant/child	2 (0.2)	4 (0.5)	2 (0.6)
Student/pupil	0 (0)	0 (0)	1 (0.3)
Disabled	7 (0.6)	1 (0.1)	0 (0)
Other	1 (0.1)	9 (1.1)	5 (1.5)
Total	1,131 (100.0)	815 (100.0)	327 (100.0)

Source: Household baseline survey 2015–16

Note: Row percentages in parentheses

## Asset ownership

### Livestock holdings

The results presented in Table 4 indicate that livestock in general make significant contributions to the livelihoods of households and are thus considered a productive asset. The main products from livestock are meat, milk, eggs and traction, but livestock also serve as a convertible asset and a source of self-reliance against income shocks. As indicated in Table 4, cattle, goats, sheep, donkeys, chickens and ducks are the dominant species. Tropical livestock unit (TLU) was used in order to make comparisons of herd sizes across the different livestock species to produce a single number that indicates the amount of livestock owned, a procedure recommended by Njuki et al. (2011). The results of the analysis reveal that most of the households in all subnational zones own some livestock, but average holdings are small (Table 4).

On average, livestock ownership is dominated by cattle, which contribute 1.47 TLUs, followed by goats at 0.31 TLUs. However, average livestock ownership varied across the project subnational zones.

Table 4: Livestock asset ownership in TLUs in Tanzania (2015–16)

Livestock species	Subnational zones					
	Central semi-arid n =238	Eastern subhumid n=227	Southern highlands n=226	Lake zone n=231	Southern humid n=238	Total n=1,160
Cattle	2.30 (4.65)	0.61 (2.19)	0.87 (1.62)	3.11 (4.90)	0.42 (2.05)	1.47 (3.55)
Sheep	0.07 (0.27)	0.02 (0.23)	0.01 (0.07)	0.20 (0.49)	0.02 (0.11)	0.06 (0.28)
Goats	0.48 (0.93)	0.21 (0.68)	0.10 (0.23)	0.45 (0.72)	0.32 (0.66)	0.31 (0.70)
Chickens	0.23 (0.15)	0.36 (0.31)	0.26 (0.25)	0.29 (0.19)	0.22 (0.15)	0.27 (0.22)
Donkeys	0.01 (0.13)	0.01 (0.10)	0.01 (0.10)	0.00 (0.00)	0.00 (0.00)	0.00 (0.09)
Ducks	0.01 (0.05)	0.03 (0.10)	0.01 (0.04)	0.03 (0.12)	0.00 (0.02)	0.02 (0.08)

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

Table 5 presents the average number of livestock by gender disaggregated ownership. The results of the data indicate that the most common livestock ownership pattern is joint ownership between the household head and spouse. The next most frequent ownership pattern is by the male members of a household. The average household herd sizes are also reported in Table 5.

Table 5: Ownership of livestock by gender disaggregated in Tanzania (2015–16)

Livestock species	Subnational zones					
	Central semi-arid n =238	Eastern subhumid n=227	Southern highlands n=226	Lake zone n=231	Southern humid n=238	Total n=1,160
Goats men	0.48 (3.28)	0.17 (1.52)	0.00 (0.00)	1.77 (4.67)	0.05 (0.50)	0.49 (2.73)
Goats women	0.38 (1.78)	0.47 (2.72)	0.11 (0.67)	0.48 (3.16)	0.10 (0.83)	0.31 (2.08)
Goats joint	4.14 (8.86)	1.44 (5.91)	0.88 (2.28)	2.22 (5.65)	3.00 (6.56)	2.36 (6.35)
Goats household	5.00 (9.50)	2.07 (6.80)	0.99 (2.34)	4.47 (7.21)	3.15 (6.57)	3.16 (7.06)
Cattle men	0.66 (3.99)	0.13 (1.11)	0.08 (0.89)	3.72 (8.68)	0.05 (0.61)	0.93 (4.55)
Cattle women	0.28 (1.34)	0.44 (2.87)	0.05 (0.41)	0.31 (1.71)	0.11 (0.93)	0.24 (1.67)
Cattle joint	3.66 (8.69)	0.65 (3.14)	1.61 (3.15)	2.19 (5.92)	0.68 (3.98)	1.77 (5.54)

Livestock species	Subnational zones					
	Central semi-arid n =238	Eastern subhumid n=227	Southern highlands n=226	Lake zone n=231	Southern humid n=238	Total n=1,160
Cattle household	4.59 (9.30)	1.22 (4.37)	1.73 (3.24)	6.23 (9.79)	0.84 (4.10)	2.93 (7.10)
Sheep men	0.09 (1.30)	0.03 (0.30)	0.00 (0.00)	0.94 (3.89)	0.00 (0.00)	0.21 (1.87)
Sheep women	0.03 (0.38)	0.14 (1.88)	0.01 (0.20)	0.15 (0.98)	0.00 (0.00)	0.07 (0.96)
Sheep jointly	0.55 (1.94)	0.06 (0.93)	0.10 (0.71)	0.87 (3.10)	0.16 (1.13)	0.35 (1.82)
Sheep household	0.68 (2.71)	0.23 (2.33)	0.11 (0.73)	1.96 (4.85)	0.16 (1.13)	0.63 (2.84)
Donkeys men	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Donkeys women	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Donkeys joint	0.02 (0.26)	0.01 (0.20)	0.01 (0.20)	0.00 (0.00)	0.00 (0.00)	0.01 (0.17)
Donkeys household	0.02 (0.26)	0.01 (0.20)	0.01 (0.20)	0.00 (0.00)	0.00 (0.00)	0.01 (0.17)
Chickens household <sup>3</sup>	23.36 (15.43)	35.70 (31.08)	25.56 (24.74)	28.67 (19.0)	21.79 (15.03)	26.94 (22.31)
Ducks men	0.01 (0.13)	0.05 (0.34)	0.00 (0.00)	0.30 (2.37)	0.00 (0.00)	0.07 (1.07)
Ducks women	0.00 (0.00)	0.28 (1.55)	0.01 (0.20)	0.13 (1.03)	0.01 (0.13)	0.09 (0.84)
Ducks joint	0.47 (1.75)	0.77 (2.73)	0.27 (1.22)	0.56 (2.97)	0.09 (0.78)	0.43 (2.07)
Ducks household	0.48 (1.76)	1.10 (3.26)	0.28 (1.23)	0.99 (3.87)	0.10 (0.79)	0.59 (2.50)
Rabbits men	0.00 (0.00)	0.01 (0.13)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.06)
Rabbits women	0.00 (0.00)	0.01 (0.13)	0.04 (0.60)	0.00 (0.00)	0.00 (0.00)	0.01 (0.27)
Rabbits joint	0.00 (0.00)	0.04 (0.66)	0.33 (2.05)	0.01 (0.13)	0.01 (0.13)	0.08 (0.96)
Rabbits total	0.00 (0.00)	0.06 (0.71)	0.37 (2.13)	0.01 (0.13)	0.01 (0.13)	0.09 (1.00)
Guinea fowl men	0.01 (0.13)	0.00 (0.00)	0.00 (0.00)	0.02 (0.26)	0.00 (0.00)	0.01 (0.13)
Guinea fowl women	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Guinea fowl joint	0.26 (1.56)	0.02 (0.27)	0.29 (3.36)	0.01 (0.20)	0.00 (0.00)	0.12 (1.65)
Guinea fowl household	0.26 (1.57)	0.02 (0.27)	0.29 (3.36)	0.03 (0.33)	0.00 (0.00)	0.12 (1.66)

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

## Farm and household domestic asset ownership

Based on the procedure recommended for all BMGF-funded projects (BMGF 2010–11), farm and household domestic asset indices were first computed and then asset ownership in terms of the assets index was compared across the three types of household ownership: male, female or joint. The overall results presented in Table 6 indicate that compared to women,

<sup>3</sup> Because of lack of gender disaggregated data, the chicken data is presented only at the household level.

men own more farm and household assets. The indices, for example, land male (1.5) vs. land female (1.0), farm implement male (5.6) vs. farm implement female (4.8), transport male (20.3) vs. transport female (7.8), domestic asset male (15.8) vs. domestic asset female (12.0) indicate that the important household assets are owned by men. However, joint ownership of these productive assets was by far higher than individual ownership by men.

The contribution of livestock to household assets was also analysed. The results indicate that the contribution of livestock to the household asset index varies across subnational zones, ranging from 7.4% in eastern subhumid to up to 26.9% in the lake zone. For the entire sample, on average, the contribution of livestock to the household asset index is 15.6%.

Table 6: Household and domestic assets ownership index in Tanzania (2015–16)

Asset ownership	Subnational zones					Total n=1,160
	Central semi- arid n=238	Eastern subhumid n=227	Southern highlands n=226	Lake zone n=231	Southern humid n=238	
Land male	2.07 (7.37)	1.49 (16.44)	0.40 (2.04)	2.57 (6.51)	1.04 (4.49)	1.52 (8.82)
Land female	1.58 (4.58)	1.78 (7.68)	0.34 (1.17)	0.53 (2.35)	1.01 (3.71)	1.05 (4.50)
Land joint	5.56 (12.04)	2.53 (6.00)	2.48 (3.62)	1.99 (4.64)	4.89 (7.43)	3.52 (7.54)
Farm implements male	2.61 (10.71)	7.93 (22.76)	3.35 (15.51)	12.48 (26.11)	1.90 (8.17)	5.62 (18.34)
Farm implements female	4.85 (13.62)	6.88 (17.43)	4.42 (20.06)	4.99 (10.53)	2.97 (9.39)	4.81 (14.73)
Farm implements joint	47.44 (155.96)	33.50 (100.56)	32.28 (37.48)	23.13 (41.14)	43.83 (120.12)	36.18 (102.87)
Transport assets male	16.08 (138.91)	53.46 (261.70)	4.98 (12.96)	24.13 (104.88)	3.99 (10.38)	20.35 (140.93)
Transport assets female	5.82 (68.51)	18.14 (158.15)	3.60 (10.77)	6.05 (16.78)	5.66 (26.51)	7.81 (78.01)
Transport assets joint	26.76 (76.28)	31.51 (94.79)	62.78 (251.83)	27.90 (42.33)	59.65 (247.05)	41.68 (168.37)
Domestic assets male	12.04 (22.13)	16.49 (19.81)	14.93 (29.31)	23.27 (56.91)	12.44 (11.16)	15.79 (32.06)
Domestic assets female	11.21 (17.47)	14.26 (17.56)	11.88 (20.37)	10.80 (12.31)	12.05 (22.42)	12.03 (18.37)
Domestic assets joint	10.13 (24.94)	12.06 (20.13)	15.37 (40.61)	13.41 (44.68)	15.99 (27.05)	13.38 (32.81)
Household asset index	224.85 (389.12)	251.02 (415.94)	201.60 (322.60)	257.38 (239.67)	199.06 (331.64)	226.63 (345.51)
Livestock contribution to household asset index (%)	21.73 (24.57)	7.37 (16.88)	12.91 (17.96)	26.98 (25.50)	8.75 (14.53)	15.58 (21.72)

Source: Household baseline survey 2015–16

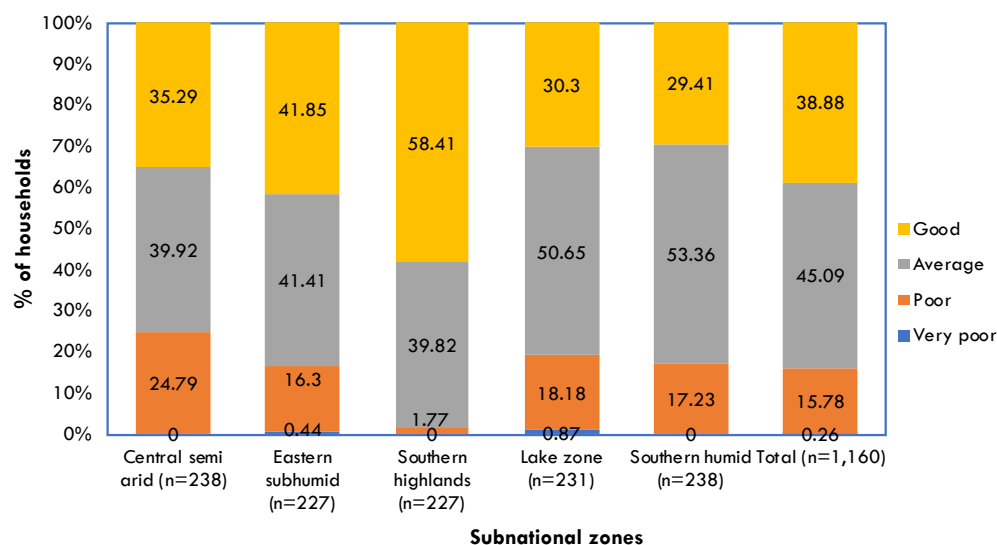
Note: The numbers in parentheses are standard deviations.

## Quality of housing

Based on a procedure recommended by a gender, livestock and livelihood indicators report (Njuki et al. 2011), the Cashpor Housing Index (CHI) was used to classify the quality of the housing conditions of the survey participants. CHI uses the external housing conditions such as number of rooms, floor, wall and roofing material of the house as a proxy for poverty condition of a household. The idea behind CHI is based on the principle that poor households spend their income on basic household necessities and social commitments rather than investing in their houses. Based on the CHI, housing conditions are classified as very poor, poor, average and good quality (Figure 3). The results of the analysis indicate that in central semi-arid, the lake zone and southern humid, 39.92%, 50.65% and 53.36%, respectively, of the sample households are living in average quality housing. The majority of households in the southern highlands (58.741%) and 41.85% in eastern subhumid are living in a good quality house. The overall results of the sample households across all subnational zones

indicate that 0.26%, 15.78%, 45.09% and 38.88% of the households are living in very poor, poor, average and good quality housing conditions, respectively (Figure 3).

Figure 3: Farmers housing conditions in Tanzania (2015–16).



Source: Household baseline survey 2015–16

### 3.3 Food security

Livestock are maintained in the study subnational zones and considered a productive asset and important contribution to food security for households. Livestock provide milk, meat and eggs which increase households' consumption of animal-sourced food. Moreover, the contribution of livestock to food security is related to income from sale of livestock and livestock products, which is often used for purchase of additional food items from the market necessary for the household. Livestock are also a wealth indicator and generally play a crucial role in the provision of transportation services, trading activities and ploughing croplands. The next subsection of the report focuses on availability, access and consumption aspects of food security dimensions.

#### Adequate food provisioning in the last 12 months

Household food access is defined as the ability of a household to obtain food both in quality and quantity from their own produce, purchase or exchange food or received as a gift to meet the family member food nutritional requirements. The months of adequate household food provisioning was used as proxy measure for measuring food access.

Table 7: Adequate food provisioning in the last 12 months in Tanzania (2015–16)

Characteristics	Subnational zones					
	Central semi-arid n=236	Eastern subhumid n=226	Southern highlands n=226	Lake zone n=226	Southern humid n=233	Total n=1,147
Proportion of food adequate households (%)	79	85	91	91	98	89
Average months of adequate food	9.51 (4.88)	10.14 (4.35)	10.88 (3.49)	10.94 (3.42)	11.79 (1.56)	10.65 (3.79)

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

The results of the data on the proportion of food adequate households and average months of food adequacy are presented in Table 7. Food adequacy in terms of proportion of food adequate households indicates that there are some

marked variations across the subnational zones. Out of the total sample households, 98%, 91%, 91%, 85% and 79% of the respondents in southern humid, the lake zone, southern highlands, eastern subhumid and central semi-arid, respectively, reported that they had enough food in the last 12 months. The overall sample results indicate that 89% of the respondents reported that they had adequate food in the last 12 months for their household.

## Dietary diversity score

The household dietary diversity score (HDDS) is commonly used as one main dimension of quality diet. It refers to counting the number food groups consumed within and across the different groups rather than the number of different foods consumed on a 24-hour recall period divided by the total number of households. The HDDS can also be adapted and used to compute an individual dietary diversity score (IDDS), a proxy measure of the nutritional quality of an individual's diet. It reveals the concept that increasing food varieties and different food groups in the diet ensure adequate intake of essential nutrients, and promote and maintain better health. On the other hand, the HDDS is used as a proxy measure of the socio-economic status of the household. To assess the IDDS in each household, an adult male (usually the head of household if present), an adult female (usually the spouse or head of household if present) and an index child (less than five years) were interviewed and asked to recall what meals they had consumed in the last 24 hours. It covers a total of 12 food groups which are cereals, roots and tubers, vegetables, fruits, meat, eggs, fish, pulses/legumes/nuts, milk and milk products, oils and fats, sugar/honey/sweets, and spices, condiments and beverages.

Table 8: IDDS in Tanzania (2015–16)

Individual household members	Subnational zones					Total
	Central semi-arid	Eastern subhumid	Southern highlands	Lake zone	Southern humid	
Children (< 5 years)	5.86 (1.88) n=174	7.56 (2.59) n=97	5.52 (2.04) n=92	4.44 (1.97) n=156	6.30 (2.28) n=104	5.79 (2.34) n=623
Women (reproductive age)	5.55 (1.83) n=213	6.88 (2.62) n=214	5.68 (1.84) n=205	4.64 (1.87) n=228	6.14 (1.94) n=231	5.77 (2.17) n=1,091
Men	5.40 (1.90) n=160	7.27 (2.37) n=162	5.66 (1.81) n=161	4.65 (1.84) n=213	6.16 (1.92) n=211	5.78 (2.15) n=907

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

The results of the data presented in Table 8 indicate that at the subnational zone level, the IDDS is higher in eastern subhumid for index children, women and men, with an average score of 7.56, 6.88 and 7.27, respectively. Next to the eastern subhumid subnational zone, the highest IDDS was reported in southern humid with an index of 6.30, 6.14 and 6.16 for index children, women and men, respectively. The IDDS for children, women and men is lowest in the lake zone with an average score of 4.44, 4.64 and 4.65, respectively. Across the subnational zones, the IDDS is higher for index children (5.79) than women and men.

## Food consumption score

FCS is the frequency of consumption of nine food groups over a seven-day recall period weighted by nutritional value of the food group. The food groups considered are staples: vegetables, fruits, pulses, meat, fish, milk, oil, sugar and condiments. In computing FCS, foods that are usually nutrient rich receive more weight than low nutrient foods. The FCS was computed for men, women and children. An FCS of 0–21 is considered poor and 21.5–35 is considered borderline, while an FCS greater than 35 is considered acceptable.

The results presented in Table 9 indicate that the FCS is highest among children in central semi-arid and eastern subhumid subnational zones. However, in southern highlands, the lake zone and southern humid the highest FCS was reported for women. The highest average FCS (62.85) was reported for children in eastern subhumid and is lowest in the lake zone (44.9). The FCS for children, women and men is highest in eastern subhumid and lowest in the lake zone. Overall, the mean value of the FCS was above 35, which is considered acceptable.

Table 9: FCS in Tanzania (2015–16)

Household members	Subnational zones					
	Central semi-arid	Eastern subhumid	Southern highlands	Lake zone	Southern humid	Total
Children (< five years)	54.28 (16.23) n=174	62.85 (22.16) n=97	51.30 (16.59) n=92	44.49 (19.63) n=156	55.66 (18.40) n=104	52.95 (19.41) n=623
Women (reproductive age)	51.77 (15.13) n=213	62.46 (21.26) n=215	51.88 (16.55) n=207	46.57 (20.34) n=228	55.97 (16.50) n=232	53.70 (18.86) n=1,095
Men	50.46 (14.74) n=160	61.69 (20.62) n=162	52.16 (15.30) n=161	47.01 (20.32) n=213	55.70 (16.29) n=211	53.18 (18.38) n=907

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

## Consumption of chicken and chicken products

Table 10 presents the general overview of households' consumption of chicken (live birds) and eggs in the last three months in the study subnational zones. Consumption of both live birds and eggs was interpreted using the mean number of birds and eggs consumed either from their home production or purchased from other sources. The results of the data indicate that live-bird consumption was highest in the lake zone and lowest in the southern highlands subnational zones. On average, households in the lake zone consumed 4.29 birds while in southern highlands, the number was 2.05. Central semi-arid is the second highest subnational zone in bird consumption, where on average household consumes 3.27 birds. Across all of the subnational zones, the average consumption of live birds is 3.0. The low average number of birds consumed is related to households' decision to sell live birds in order to meet their immediate cash needs.

Table 10: Chicken and egg consumption (numbers consumed in the last three months) in Tanzania (2015–16)

Poultry and Poultry products	Subnational zones					
	Central semi-arid	Eastern subhumid	Southern highlands	Lake zone	Southern humid	Total
Birds produced from farm for consumption	3.17 (3.49)	2.82 (3.61)	1.95 (1.74)	4.10 (3.51)	2.53 (1.82)	2.86 (3.03)
Birds purchased	0.10 (0.55)	0.20 (0.84)	0.09 (0.38)	0.20 (0.99)	0.10 (0.56)	0.14 (0.68)
Total birds consumed	3.27 (3.56)	3.02 (3.65)	2.05 (1.76)	4.29 (3.75)	2.63 (1.91)	3.00 (3.11)
Eggs produced from farm for consumption	10.95 (12.22)	13.13 (14.47)	17.83 (19.00)	7.48 (13.60)	18.38 (17.85)	13.84 (16.09)
Eggs purchased	0.17 (1.23)	1.44 (6.31)	1.34 (5.08)	0.51 (2.99)	0.48 (3.11)	0.80 (4.23)
Total eggs consumed	11.12 (12.15)	14.57 (15.72)	19.17 (19.37)	7.99 (14.43)	18.86 (17.89)	14.63 (16.58)

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.



There is a wide variation in egg consumption between subnational zones (Table 10). Egg consumption is highest in the southern highlands (19.17 eggs) and lowest in the lake zone (8.00). Across the subnational zones, the average egg consumption is 14.63 eggs. The low average number of eggs consumed is related to households' choice to incubate eggs (using the mother hen) in an attempt to increase the flock.

## 3.4 Chicken production, purposes and objectives of keeping chicken

### Poultry-keeping practices

In this study, we explored the duration of chicken keeping in the households in order to assess smallholder chicken-keeping practices. Poultry-keeping experience is an important parameter to classify and target smallholder households for the on-farm experimental intervention of the project. At least two years of chicken-keeping experience is required to be recruited as a participant in the on-farm study. As indicated in Table 11, the results reveal that the mean duration (years) of chicken keeping is highest in the lake zone with a mean duration of 10.2 years and lowest in eastern subhumid with a mean duration of 4.1 years. This indicates that the duration of poultry keeping is not uniform across the subnational zones. Among all of the sampled households, the mean duration of chicken keeping is 8.5 years. This information contributes to the understanding of project target households in terms of knowledge level and targeting of training. The study also indicates that the majority of the 1,106 (95.34%) households kept poultry for at least two years.

Table 11: Mean duration of chicken-keeping experience by households in years in Tanzania by subnational zone (2015–2016)

Subnational zones	Observations (n)	Mean	Max
Central semi-arid	238	9.34 (7.38)	40
Eastern subhumid	227	4.07 (3.92)	26
Southern highlands	226	9.45 (8.72)	54
Lake zone	231	10.17 (8.56)	43
Southern humid	238	9.05 (7.66)	40
Total Mean	1,160	8.44 (7.76)	54

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

### Flock size per household

The study examined the average flock size per household (Table 12). The average number of chickens in all of the sampled subnational zones is 26.93 chickens per household. Of all the sampled households with flocks, about 70.34% kept less than 30 chickens; 46.29% of the households kept less than 20 chickens. The multiple response analysis indicates that, in terms of breeds, an overwhelming majority (92.51%) of the sample households kept the local breeds of chicken while 7.49% of the sample households kept other chicken breeds.

Table 12: Flock size per household in the different subnational zones in Tanzania (2015–16)

Subnational zones	Observations (n)	Average number of chickens per households
Central semi-arid	238	23.35 (15.43)
Eastern subhumid	227	35.69 (31.07)
Southern highlands	226	25.56 (24.73)
Lake zone	231	28.66 (19.00)
Southern humid	238	21.79 (15.03)
Total mean	1,160	26.93 (22.31)

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

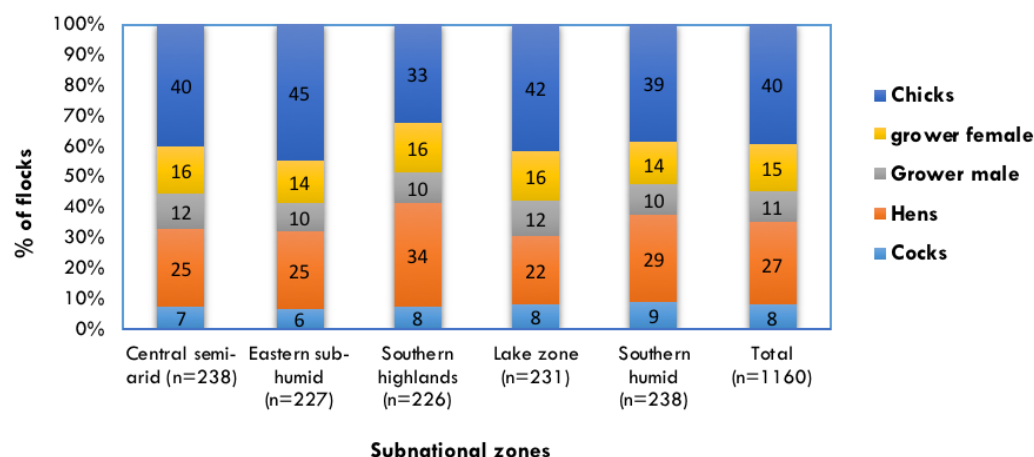
There are variations in the mean flock size between the subnational zones. The highest flock size per household was reported from eastern subhumid (35.69) while the lowest mean flock size per household is in southern humid (21.79). The higher mean flock size in the eastern subhumid subnational zone could be a result of market availability, better animal health services and various project interventions.

## Flock composition per household

The results of this study indicate that the structure and composition of flocks in sample households are dominated by chicks followed by hens, which is in agreement with the literature that reports a typical flock structure consists of chicks, pullets (grower female), cockerels and hens. As indicated in Figure 4, the flocks are composed of a greater number of adult chickens—grower female, grower male, hens and cocks—(60%) than chicks (40%). Overall, of the total flocks counted, chicks constituted the largest share (40%) of the flocks.

However, about 20.43% of the households did not have a chick in their flock. Hens account for 27% of the total flocks, while young chicks account for approximately 26% of the total flocks. Among flocks, the ratio of cockerels to hens is (1:3.3). Hens, grower females and chicks constitute almost 76%, which implies that farmers need to keep females for breeding and reproduction purposes.

Figure 4: Chicken-flock composition per household in different subnational zones in Tanzania (2015–16).



Source: Household baseline survey 2015–16

## Reasons for keeping chicken

Table 13 presents the rank indices for the purposes and objectives of keeping chickens by the sample households in the different subnational zones in Tanzania.

Table 13: Ranking of chicken production purposes and objectives by households in different subnational zones in Tanzania (2015–16)

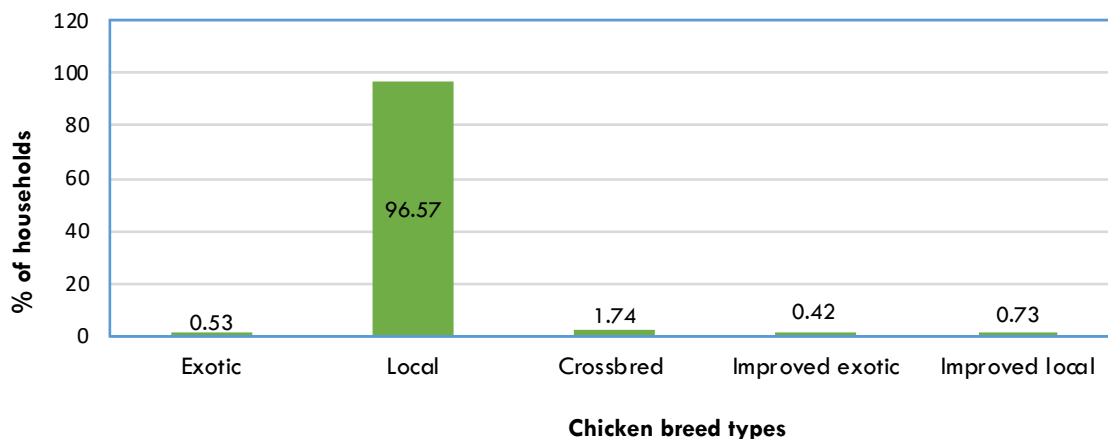
Production objectives	Rank index of chicken production purposes and objectives				
	Central semi-arid	Eastern subhumid	Southern highlands	Lake zone	Southern humid
Meat consumption	0.39	0.39	0.37	0.32	0.44
Egg consumption	0.09	0.14	0.15	0.16	0.21
Meat sale	0.00	0.02	0.06	0.02	0.04
Egg sale	0.06	0.09	0.09	0.04	0.03
Chick sale	0.05	0.02	0.12	0.01	0.00
Ceremonies/festivals	0.00	0.00	0.00	0.09	0.00
Give away	0.00	0.00	0.00	0.00	0.00
Cock fighting	0.00	0.00	0.00	0.00	0.00
Live-adult chicken sale	0.40	0.33	0.21	0.31	0.27

Source: Household baseline survey 2015–16 NB: Index =  $[(3 \times \text{number of households ranking as first} + 2 \times \text{number of households ranking as second} + 1 \times \text{number of households ranking as third}) / (3 \times \text{total number of households ranking any purpose first} + 2 \times \text{total number of households ranking any purpose as second} + 1 \times \text{total number of households ranking any purpose as third})]$ .

### Farmers' chicken-breed preference

In this study, we explored household preferences for different breed types of chicken even in households that do not keep all breed types. The multiple response analysis results reveal that the majority of the households (96.57%) preferred the local chicken breeds over the other chicken-breed types (Figure 4). The crossbred and improved local breeds, which are considered more productive, were ranked the second and third most preferred breeds over, respectively (Figure 5).

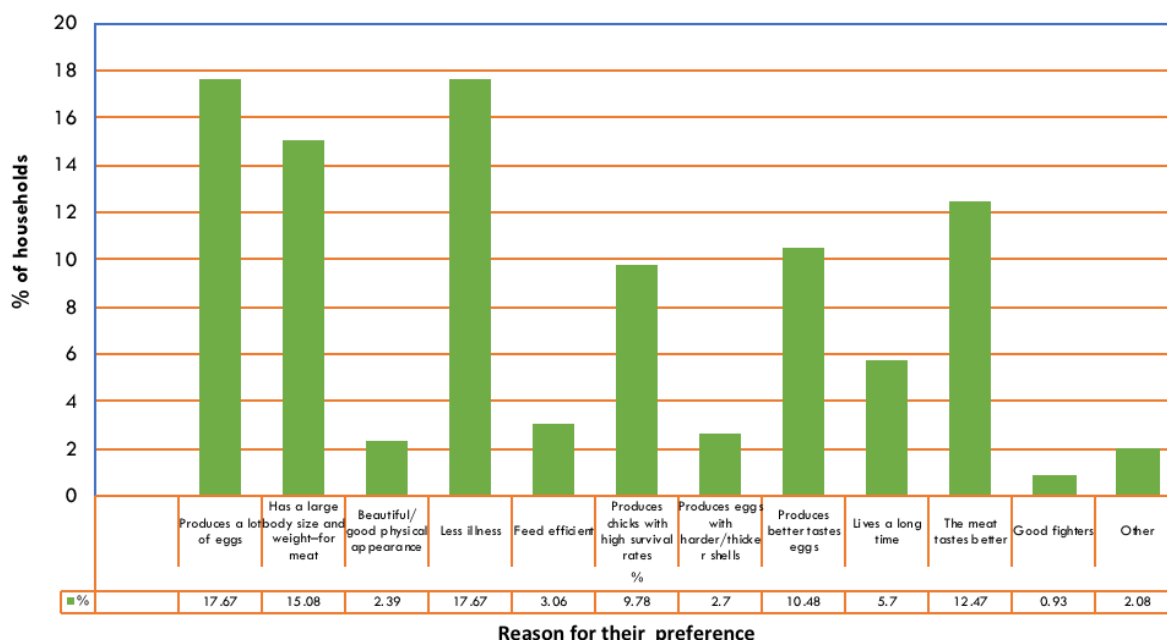
Figure 5: Chicken-breed preferences by farm households in Tanzania (2015–16).



Source: Household baseline survey 2015–16

The reasons for local chicken-breed preference were many, however, more eggs (17.67%), less illness (17.67%), large body size (15.08%), better meat taste (12.47%), better egg taste (10.48%) and produce chicks with high survival rate (9.78%) are the major reasons (Figure 6).

Figure 6: Household reasons for breed preferences in Tanzania (2015–16).



## Trait preferences

The rank index of trait preferences for the selection of cockerels and hens irrespective of farmers' selection of specific chickens for breeding purpose was analysed and is presented in Table 14. The results reveal that for cockerels, the most important traits are large body size and weight, better meat taste, less illness and good physical appearance. Lives a long time, feed efficient and good fighter were not highly ranked traits, although farmers considered them important. Production of more eggs, production of chicks with high survival rate, and large body size and weight are the most important traits for good hens.

Table 14: Attributes/qualities of good cockerels and hens in Tanzania (2015–16)

Attributes/ qualities of a good chicken	Rank index of attributes/qualities of a good chicken									
	Cockerels					Hens				
	Central semi-arid	Eastern subhumid	Southern highlands	Lake zone	Southern humid	Central semi- arid	Eastern subhumid	Southern highlands	Lake zone	Southern humid
Large body size and weight	0.48	0.57	0.52	0.35	0.47	0.13	0.19	0.23	0.17	0.11
Less illness	0.16	0.23	0.13	0.08	0.08	0.07	0.15	0.12	0.04	0.07
Meat taste better	0.11	0.03	0.02	0.06	0.20	0.10	0.02	0.02	0.05	0.10
Good physical appearance	0.08	0.05	0.16	0.22	0.06	0.02	0.02	0.04	0.10	0.00
Lives a long time	0.07	0.03	0.04	0.07	0.08	0.02	0.00	0.01	0.01	0.05
Good fighter	0.03	0.02	0.05	0.06	0.08	0.00	0.00	0.01	0.01	0.00
Feed efficient	0.02	0.00	0.02	0.02	0.01	0.00	0.00	0.01	0.00	0.00
Produces a lot of eggs	0.01	0.01	0.01	0.04	0.00	0.36	0.40	0.34	0.40	0.37
Produces better- tasting eggs	0.02	0.01	0.01	0.01	0.01	0.14	0.02	0.01	0.05	0.17
Produces eggs with harder/ thicker shell	0.01	0.00	0.00	0.02	0.00	0.03	0.01	0.03	0.03	0.03
Produce chicks with high survival rate	0.01	0.05	0.04	0.07	0.00	0.11	0.18	0.18	0.15	0.09

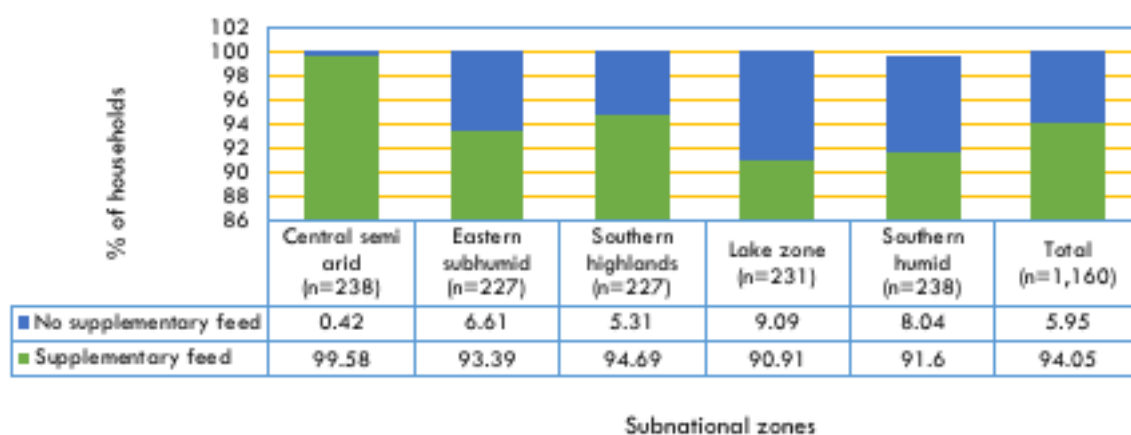
Source: Household baseline survey 2015–16

Note: Index =  $[(3 \times \text{number of households ranking as first} + 2 \times \text{number of households ranking as second} + 1 \times \text{number of households ranking as third}) / (3 \times \text{total number of households ranking any purpose first} + 2 \times \text{total number of households ranking any purpose as second} + 1 \times \text{total number of households ranking any purpose as third})]$ .

## Existing practice of supplementary feed

Supplementary feed is a major limiting factor in village chicken production. As indicated in Figure 7, the majority of households (94.05%) have had experience of providing supplementary feeding to their chickens at any time of the year. Supplementary feed in this study is defined as 'any feed not obtained from scavenging.' The results indicate that the majority of the households in all subnational zones have sufficient experience of giving supplementary feed for their chickens. This implies that households understand the importance of supplementation to enhance production and productivity. However, the practice of supplementation was much less in the central subnational zone, which is semi-arid and frequently plagued with draught. Overall, the willingness to supplement chicken feed is important information for the on-farm component of the project. However, it is necessary to monitor the frequency of supplementation and the pressure on the households in terms of the need to supplement because of increased flock size and higher-feed-consuming breeds.

Figure 7: Existing practice of provision of supplementary feed for chickens in Tanzania (2015–16).



Source: Household baseline survey 2015–16

### 3.5 Chicken labour allocations

The average time spent in minutes on chicken activities by the different household members is presented in Table 15. The results of the data indicate that all members of the household spend some time on chicken-related activities. However, the time spent by the different household members varies across the subnational zones. The overall results indicate that the average time spent is higher for adult female members of the household than for the rest of the household members. On average, adult women spend 138.44 minutes per week on chicken activities. Next to women, adult men spend more time than children and hired labour. On average, adult men spend 46.70 minutes per week on all chicken activities. The results imply that the care of chicken and chicken management are the responsibilities of women in the household. However, even though the time spent by adult men and children is less compared to women, they still play a considerable role in chicken management.

Table 15: Chicken labour allocation (minutes in the last one week) in Tanzania (2015–16)

Household members	Subnational zones					
	Central semi-arid n=238	Eastern subhumid n=227	Southern highlands n=226	Lake zone n=231	Southern humid n=238	Total n=1,160
Adult males	26.24 (72.03)	49.23 (106.35)	47.54 (139.61)	50.53 (127.47)	60.21 (108.33)	46.70 (113.15)
Adult females	204.21 (178.62)	130.78 (195.66)	108.10 (141.70)	108.12 (160.05)	138.20 (156.15)	138.44 (170.94)
Children	37.38 (142.06)	16.87 (103.65)	9.07 (60.86)	33.25 (127.18)	3.91 (24.83)	20.16 (102.23)
Hired males	0.25 (3.89)	2.09 (19.71)	0.78 (8.94)	0.37 (4.98)	0.11 (1.62)	0.71 (10.02)
Hired females	1.92 (19.60)	0.96 (8.52)	0.31 (4.04)	0.46 (4.34)	0.27 (4.21)	0.79 (10.18)

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

## 3.6 Chicken marketing

### Live-bird marketing

The market channel, number of households using each of the market channels, number of birds sold and the total revenue from sale of birds in the last three months are presented in Table 16. Generally, the results of the data indicate that using trader is the largest market channel with 369 households utilizing this means of trading to sell their chickens. On average, in this market channel, 5.54 of birds were sold during a three-month period. The second largest market channel is individual (fellow farmers), used by 356 households. However, in terms of the number of birds sold, the village market channel is the highest compared with the other marketing channels. On average, 6.88 birds were sold in this channel. City market and restaurant market channels are also important market outlets in which, on average, 5.71 and 1.5 birds were sold, respectively. However, compared to other market outlets, only a smaller number of households sold their birds to nearby restaurants. Overall, out of 793 households, the average sale is 5.66 birds sold in the different market outlets for which households receive an average sales revenue of TZS41,466.67 (Table 16).

Table 16: Marketing of chicken (last three months) in Tanzania (2015–16)

Description of items	Market channel and household numbers using the channel					
	Individual n=356	Traders n=369	Village market n=52	City market n=14	Restaurant n=2	Total n=793
Number of birds sold	5.49 (6.49)	5.54 (6.33)	6.88 (7.16)	5.71 (5.03)	1.50 (0.71)	5.66 (6.43)
Total sales revenue	39,612.09 (27,953)	42,074.65 (27,968)	41,293.33 (28,366)	45,457.14 (34,928)	18,500.00 (16,263)	41,466.67 (28,518.9)
Transport cost	451.61 (2,615.70)	500.00 (1,813.92)	45.45 (210.71)	2,071.43 (1,940.04)	.	535.37 (1,978.78)

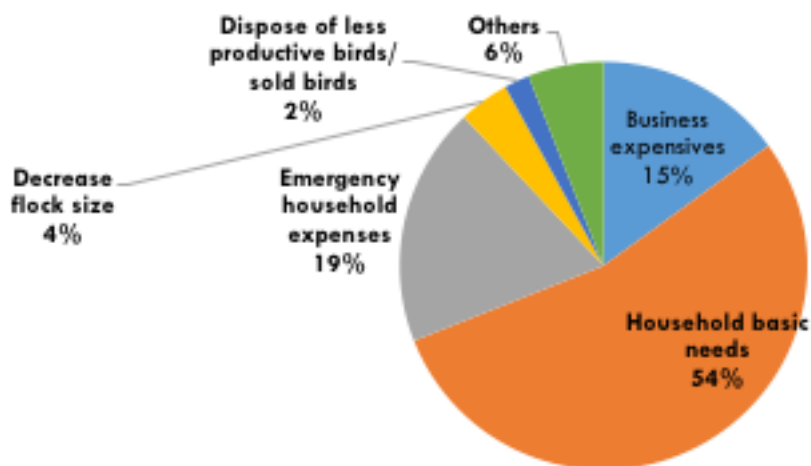
Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

### Reasons for selling live birds

In this study, households identified six essential reasons for selling their chickens. As presented in Figure 8, most of the sample households (54%) reported that the main reason for selling chickens is to use the money for covering household basic needs, followed by emergency household needs (19%), business purposes (15%), decrease flock size (4%) and disposal of less productive birds (2%).

Figure 8: Household reasons for selling chickens in Tanzania (2015–16).

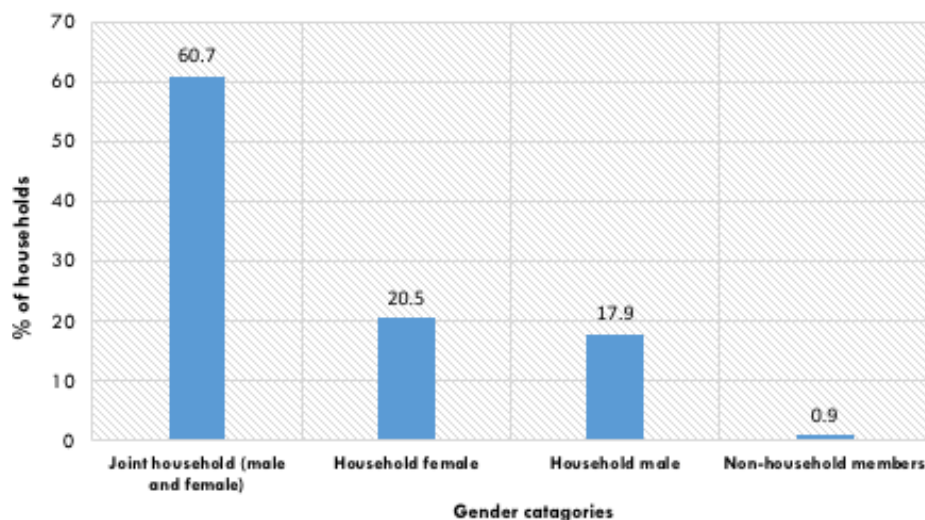


Source: Household baseline survey 2015–16

## Gender role in live-bird sales

The distribution of decision-making among women and men regarding who decides to sell chickens was explored. The results as described in Figure 9 reveal that the decision to sell was made jointly by wife and husband the majority of the time (more than 60%). When the decision to sell is not made jointly, women's decision-making power regarding sale of chickens is higher at 20.5% than men's at 17.9%. Other household and non-household members have very little decision-making role regarding the number of birds sold in the last three months.

Figure 9: Role of gender in selling chicken in Tanzania (2015–16).



Source: Household baseline survey 2015–16

## Egg marketing

The marketing channel, average egg price, average number of eggs sold and the egg sales per week are presented in Table 17. Generally, the results of the data indicate that using the individual (fellow farmer) is the largest market channel with 125 respondents reporting the use of this channel for selling eggs. On average, 15.82 eggs were sold using this market outlet per week. The second largest channel was neighbouring shops (31 households). However, in terms of the number of eggs sold, there is an inclination towards using traders compared to other marketing channels. On average, 20.35 eggs were sold in this channel per week.

The average weekly revenue from sale of eggs is TZS38,850. There is a variation in egg price across zones ranging from TZS250 to TZS306.25 (Table 17). The lowest farm-gate price was TZS250, while a higher price is obtained when households sell eggs in the city market. The overall average price received per egg is TZS284.8.

Table 17: Egg marketing (per week) in Tanzania (2015–16)

Description	Market channel and number of household using the channel								
	Individual n=125	Traders n=92	Village market n=27	City market n=2	Slaughter house n=2	Restaurant n=8	Shop n=31	Other n=2	Total n=289
Egg price	297.60 (87.26)	265.87 (70.28)	288.8 (102.2)	300.0 (0.00)	250.0 (0.00)	306.25 (41.73)	280 (70)	300.0 (0.00)	284.8 (80.9)
Times sold per week	2.68 (2.15)	1.76 (1.24)	1.59 (1.37)	4.00 (4.24)	6.00 (0.00)	1.88 (2.10)	1.45 (0.9)	1.00 (0.00)	2.15 (1.82)
Average number of eggs sold	15.82 (14.13)	20.35 (17.13)	10.19 (8.60)	12.50 (10.6)	5.00 (1.41)	14.13 (10.66)	9.29 (6.4)	30.00 (0.00)	15.99 (14.4)
Average egg sales (in TZS)	10,756.8 (1,8917)	9,616.8 (15,006.15)	4,224 (4,701.21)	8,250 (3,181.98)	7,500 (2,121.32)	5,843.7 (4,120.63)	3,806.45 (3,619.11)	9,000 (0.00)	8,850 (15,356.89)

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

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## 4. Constraints and opportunities

Based on the baseline survey results, the constraints of and opportunities for chicken production were identified to inform ACGG future research and development interventions. As described in the report, farmers prefer the local breeds over other breeds irrespective of whether they kept the breeds or not. This connotes that care needs to be taken when introducing improved or crossbred chickens in rural Tanzania. The preference of local breeds has to be measured against the commercial value and the managerial affordability of improved strains. However, this is an opportunity as well as a constraint since it directs us to incorporate the local improved breeds in Tanzania, while testing for performance and acceptability of improved strains.

The other constraint is the small proportion of female-headed households, which makes it difficult to compare variables between the male and female groups. An opportunity exists in the fact that most households have sufficient experience in raising chickens and recognize the need for supplementation. This provides a strong foundation for improving practices, especially when new breeds are introduced.



## 5. Conclusion

This research report of the survey results provides baseline data for all the subnational zones in which ACGG operates in Tanzania. Most importantly, it includes baseline characteristics of randomly selected households from all subnational zones. Since the households are representative, the results obtained from this study provide data on the underlying situations in the project villages and a basic reference for the design of the on-farm study across the project subnational areas.

The survey findings allow us to fully appreciate the realities on the ground that chicken-keeping households experience, including but not limited to housing, provision of supplementary feed and gender roles, which are important for the on-farm testing design.

The study revealed that most farmers prefer the local breeds although a few households also kept cross or exotic breeds. Poor management was a general feature across the zones leading to small flock size, low consumption of both meat and eggs and lower sales.

The study also revealed that chicken care and management are predominantly the responsibilities of women in the household. This indicates that for the on-farm experimental testing, the project should purposively target women household members as well as poor households.

Finally, since the ACGG project intervention is long-term, systematic regular monitoring of the husbandry practices, gender dynamics and accrued benefits from the innovations is imperative in order to evaluate the program prior to wider multiplication and distribution of the new strains.

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