



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



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# Household baseline data in Ethiopia: 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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July 2018


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ILRI thanks all donors and organizations which globally supports its work through their contributions to the [CGIAR Trust Fund](#)



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Editing, design and layout—ILRI Editorial and Publishing Services, Addis Ababa, Ethiopia.

Cover photo— ILRI/Apollo Habtamu

ISBN: 92–9146–562-6

Citation: Alemayehu, T., Bruno, J., Poole, J., Getachew, F., Assefa, G., Abegaz, S., Esatu, W. and Dessie, T. 2018. *Household baseline data in Ethiopia: Monitoring delivery of chicken genetic gains*. ILRI Research Report 48. Nairobi, Kenya: International Livestock Research Institute (ILRI).

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# Acknowledgements

The authors are grateful for the support provided by the Ethiopian Institute of Agricultural Research (EIAR) which implemented the household producer-level baseline survey through the regional agricultural research institutes. Particular thanks go to Getnet Zeleke and the regional project subnational coordinators (SNCs) who followed-up for the successful implementation of the baseline data collection process. Many thanks also go to the International Livestock Research Institute (ILRI) African Chicken Genetic Gains (ACGG) team based at the Addis Ababa office and the Research Methods Group team based at the Nairobi office for their role during the training workshops including the baseline conceptualization, design, development of training materials for enumerators, supervisors and SNCs, data collection process, delivery of the training and development of the sampling strategy for the survey. Our gratefulness is also extended to those who reviewed the report at different stages of its development.

Most importantly, we would like to acknowledge the hospitality and passion displayed by smallholder chicken keepers and enumerators who were involved in the baseline survey. Participation in the interview sessions was time demanding, however, it was willingly given. It is hoped that the output of this study will assist ILRI and the national partners in further improving the quality of the on-farm experimental design, thereby eventually benefiting poultry keepers throughout the country. It is clear that this project brings many people and institutions together who have made substantial contributions to this study. Any mistakes and omissions, however, are the responsibility of the authors.

This research was funded in part by the Bill & Melinda Gates Foundation (BMGF) (Grant Agreement OPP1112198) under the auspices of ILRI. The findings and conclusions contained within are those of the authors and do not necessarily reflect positions or policies of the BMGF.



# Acronyms

ACGG	African Chicken Genetic Gains
BMGF	Bill & Melinda Gates Foundation
CHI	Cashpor Housing Index
EIAR	Ethiopian Institute of Agricultural Research
ETB	Ethiopian birr
FCS	Food consumption score
HDDS	Household dietary diversity score
IDDS	Individual dietary diversity score
ILRI	International Livestock Research Institute
ODK	Open Data Kit
SNC	Subnational coordinators
SNNP	Southern Nations, Nationalities and Peoples'
TLU	Tropical livestock unit

# Executive summary

Chicken in the study subnational zones is considered a valuable asset for smallholder households and makes an important contribution to food security, poverty alleviation and the promotion of gender equality within the household. Among household survey participants, chicken mainly provides meat and eggs which relate to higher consumption of animal-sourced food. Moreover, the contribution of chicken to food security is related to income earned from the sale of chicken and chicken products, which is often used for the purchase of additional necessary food items from the market. The role of chicken as a potential tool to escape extreme poverty through its influence on the improvement of livelihoods has frequently been stated. However, there are many constraints to the development of smallholder chicken production in improving productivity and overall livelihoods of rural and peri-urban smallholder households in Ethiopia.

To address these issues, supported by a grant from the Bill & Melinda Gates Foundation (BMGF), the International Livestock Research Institute (ILRI) in collaboration with the Ethiopian Institute of Agricultural Research (EIAR) developed and started the implementation of the African Chicken Genetic Gains (ACGG) project to increase access of poor smallholder farmers to high-producing but agro-ecologically appropriate chicken genetics products. The project was implemented in the selected villages of rural and peri-urban subnational zones of the country. The rural areas of the project are represented by villages in the regional states of Tigray, Amhara, Oromia and the state of Southern Nations, Nationalities and Peoples' (SNNP). Villages in the Addis Ababa city administration represent the peri-urban system. Staff conducted a baseline study at the start of the project to assess, understand and characterize the current chicken-flock sizes, smallholder farmer chicken-production systems, germplasm ecotypes, chicken-breed preferences, husbandry practices, farmers' chicken-production objectives and the socio-economic status of smallholder chicken keepers. The baseline data was also used to inform the chicken-strain choices for the project and the implementation of the on-farm experimental testing. 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 figures.

The study revealed that only 252 (20%) 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 are 3.1, 5.5 and 45.1, respectively. The mean chicken-flock size per household is nine. The flock structure and composition are dominated by hens followed by chicks. Almost all households, 94.3%, in the study area have experience of providing supplementary feeding (i.e. any feed that was not scavenged) to their chickens at any time of the year. The study reveals that most of the households, 61%, prefer exotic breeds over other breeds, irrespective of whether they keep those breeds or not. Good physical appearance, large body size and weight for meat production, and feed efficiency are the most important traits in choosing good cockerels. For good hens, production of more eggs is the most important trait identified by the households. The results of the study also indicate that chickens are kept for multiple purposes and objectives with egg consumption, egg sale and live-adult chicken sale rated the highest.

The average quarterly household income from all sources varies from lowest in Tigray to highest in the Oromia subnational zones. Households in Tigray reported a mean quarterly income of Ethiopian birr (ETB) 2,011.20 and in Oromia, this was

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

ETB6,795.10. The contribution of poultry income to the total household income is 29.5%. With regards to their sources of livelihoods, 82.1% of households declared that crop farming was their major livelihood source; livestock keeping was the second-most highlighted as the main source of livelihood and poultry keeping was the third most important livelihood source. Across the subnational zones, the most common livestock ownership pattern is by the household head and spouse. Compared to women, men own more farm and household assets, although joint ownership was significantly higher than individually owned assets. For the entire sample, livestock contributes an average of 38.5% to the household asset index.

In the study subnational zones, of the total sample households, 96%, 92%, 87%, 81% and 79% of the respondents in Addis Ababa, Amhara, Tigray, Oromia and SNNP, respectively, reported that they had enough food over the last 12 months. Overall, 85% of the sample respondents reported that they had adequate food for their households over the last 12 months. 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 and any number below 21 constitutes a poor FCS. Across the subnational zones, the individual dietary diversity score (IDDS) is higher for children than for men and women.

Chicken and egg consumption in the three months before the survey indicates that chicken consumption was highest in Oromia and lowest in the SNNP subnational zones. On average, households in Oromia consumed 2.4 birds per three months while in SNNP, the number was 1.1. After Oromia, Tigray is the second-highest subnational zone in terms of bird consumption where on average households consumed 2.2 birds per three months. Across the subnational zones, households consumed on average 1.8 live birds per three months. Egg consumption was high in Addis Ababa and low in the Amhara and SNNP subnational zones. Average egg consumption in Addis Ababa was 42 eggs per three months while in Amhara, the average egg consumption was 13 eggs per three months. For the entire sample, the average egg consumption was 22 eggs per three months.

Labour allocation for chicken activities by the different household members indicates that on average, adult women spend 90 minutes a week on chicken-related activities. After women, children spend more time than adult males and hired labour on chicken-related activities. On average, children spend 45 minutes per week on chicken-related activities. Most households (76%) reported that they sell their chickens and use the money 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 our intent that the information generated in the 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 ACGG subnational areas. Finally, the data provides a useful reference to those studying related issues.

**Keywords:** African Chicken Genetic Gains; Ethiopia; subnational zones; chicken; longitudinal study; breed

# I. Introduction

Village chicken production plays an important role in food security and income generation for many people living in rural areas of sub-Saharan Africa. Village chicken keeping not only contributes a high per cent of the meat supply in developing countries, but it is also a widespread traditional activity in most of these countries (Sodjinou 2011). More than 80% of the poultry population of the world is found in traditional family-based poultry-production systems, contributing up to 90% of poultry products in some countries (Alabi et al. 2006; Sodjinou 2011). In a situation where many people are landless and have limited formal skills to practise and participate in income-generating activities, village poultry production plays a substantial role in income generation and poverty alleviation (Dolberg and Petersen 2000; Aklilu et al. 2008; Sodjinou 2011). However, there are many factors that hinder the productivity and performance of village chicken, which in turn affects its contribution to the increased income and food security status of smallholder chicken-keeping households in Ethiopia. The development of innovative ideas for improving rural poultry production requires a complete understanding of the system and its operators. Furthermore, research directions and strategies should be geared to addressing farmers' real problems and constraints to help them expand and become self-sufficient.

## Past attempts at improvement and lessons in Ethiopia

'Upgrading' the blood level of local birds using exotic birds through distribution of cockerels to farmers was considered the most important strategy to effect improvement by policymakers. The extension system of the Ministry of Agriculture has promoted schemes in which cockerels from selected strains (mainly White Leghorn and Rhode Island Red) are reared up to 15 to 20 weeks of age and then given out to subsistence farmers in order to 'upgrade' the genetic potential of local birds. In addition, exotic pullets and fertile eggs were distributed to individual farm households in rural Ethiopia. This approach has been practised in the last 50 or more years (Yami and Dessie 1997). Although the impact of this strategy on the genetic structure of indigenous birds has not been assessed carefully, the empirical evidence suggests that these approaches were met with limited success due to the high mortality rate of the exotic breeds (Dessie et al. 2000; Udo et al. 2002). The mortality rate of exotic birds was high because the birds were not well suited to the poor management and disease conditions in the new environment. The low impact of exotic birds distributed to rural areas could be due to their inability to brood, their lack of alertness to predators, poor colour camouflage against predators and their short legs which are unsuitable for fast running. Study reports from the highlands of Ethiopia indicate that there has been an introduction of exotic breeds to different villages at various times and in different forms, such as through the introduction of cockerels, pullets and fertile eggs, but their impact in upgrading the village chickens has been minimal. This is because the programs were of short duration and usually planned without the participation of the farmers, with no parallel improvement in feeding, housing and health care.

As summarized by 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.

It is with this understanding that the ACGG project conducted a baseline survey in 2015–16 across ACGG countries (i.e. Nigeria, Tanzania and Ethiopia) to understand, define and characterize the current smallholder chicken-production system, chicken ecotypes, current productivity, husbandry practices, farmers' production objectives and the socio-economic status of smallholder chicken keepers. Based on the Ethiopia baseline data, preliminary analyses were performed to obtain an overview and understanding of household characteristics, source of households' livelihoods, food security status, existing chicken flocks, ecotypes, smallholders' objectives for keeping chicken, chicken and chicken-product marketing, chicken husbandry practices and others in order to identify and analyse constraints and opportunities for sustainable improvement of chicken production under smallholder systems in the diverse agro-ecological regions which are potential intervention areas, to inform project design and to ultimately determine the impact of ACGG interventions.

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

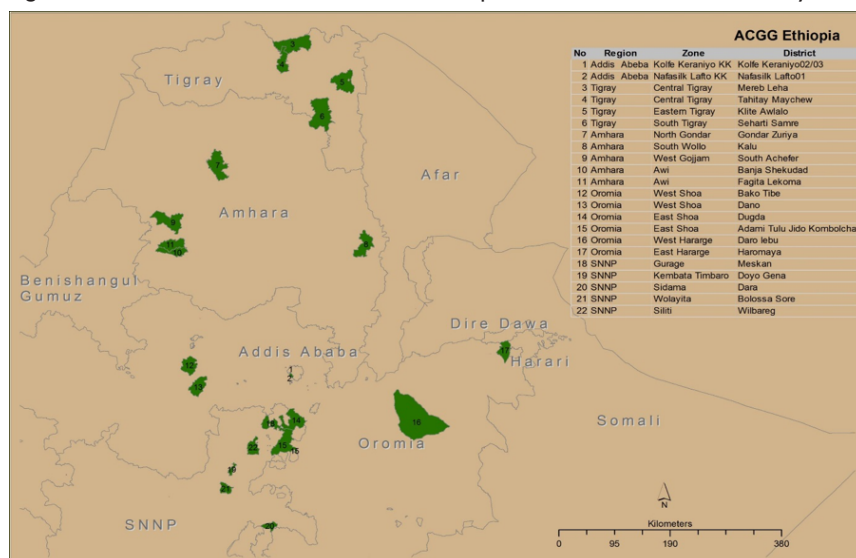
### 2.1 Study design

#### Study site selection and sampling methods

In Ethiopia, the ACGG project was implemented in rural and peri-urban areas of the country. The rural areas of the project are represented by the regional subnational zones of Tigray, Amhara, Oromia and SNNP, and the Addis Ababa city administration represents the peri-urban system (Figure 1). For this study, the selection of the subnational zones and districts was purposively based upon a high number of chickens in the sampling unit, 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, 6–18 villages were selected. The number of villages selected per subnational zone was directly proportional to the subnational zone's population. Thus, the total villages selected for the baseline study were 63. The ACGG baseline project villages first selected a cluster of villages 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 1,259 chicken-keeping households with at least two years of chicken-keeping experience were randomly selected to participate in the survey in Ethiopia and all selected households provided 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, two 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 1,257 households undertaken by the project in Ethiopia.

Figure 1: The subnational zones and districts sampled in the ACGG baseline survey.



## 2.2 Data collection

The essential 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 was developed, tested and implemented using the Open

Data Kit (ODK) data collection system. Prior to the commencement of the baseline survey, training was given to survey coordinators, supervisors and enumerators for each subnational zone. The training was conducted over a seven-day period and consisted of contained classroom training, 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 tablets, and interviewing techniques.

The classroom training 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 acted the part of the household and was interviewed by another member of the group. Moreover, in the classroom, training was given on how to use the tablets and ODK for data collection, and how to load the questionnaire in the tablets followed by role-playing using the tablets. In the field exercise, supervisors and enumerators were taken to nearby villages to practise interviewing, and to pretest both the enumerators' understanding and the questionnaire itself. Regarding techniques of interviewing, 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 pretest was reviewed and discussed, issues in the questionnaire were identified, and any tool changes were made and finalized as required.

## 2.3 Data analysis

The data collected for the baseline study include, among others<sup>1,2</sup>, household characteristics, chicken production, chicken inventory, chicken entries and exit, chicken marketing, chicken productivity, breeding-bird selection practices, trait preferences, chicken management (i.e. chicken housing, feeding, health), labour allocation 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.

1 <http://acgg.wikispaces.com/baseline>

2 <http://acgg.wikispaces.com/file/view/ACGG-ProducerLevelBaselineQu-2Sept15.pdf/571139399/ACGG-ProducerLevelBaselineQu-2Sept15.pdf>

## 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, as expected, households in the peri-urban areas of Addis Ababa had attained a better education level than other subnational zones. Household heads in Tigray and Amhara had very low education level attainment compared to other subnational zones. For the entire sample, the average number of years of schooling is 3.1.

With regard to the age of the household head, the results in Table 1 indicate that the average age of the sample households varies greatly. On average, household heads in Tigray are older than in other subnational zones. The average age of household heads in Tigray is 51.1 years. For the entire sample of households across the subnational zones, the average age of the household heads is 45.1 years. Family size of the household head was also one of the variables addressed in this study. The results in Table 1 show that on average, family size is lowest in Addis Ababa with an average family size of 4.9 individuals and highest in Oromia with an average size of 5.9. The overall results indicate that the average household size in the study area is 5.5 with a minimum of one member and maximum of 14 members.

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

Subnational zones	Variables	Mean	Number of observations
Tigray	Family size	5.1 (2.1)	180
	Age in years	51.1(13.5)	180
	Number of years of schooling	1.8 (2.9)	180
Amhara	Age in years	43.3 (17.5)	121
	Number of years of schooling	5.3 (4.1)	121
	Number of years of schooling	2.0 (3.2)	297
Oromia	Family size	5.9 (2.2)	281
SNNP	Family size	5.4 (1.6)	277
	Age in years	42.4 (11.9)	277
	Number of years of schooling	3.7 (3.4)	276
Addis Ababa	Family size	4.9 (1.98)	121
	Age in years	42.0 (12.3)	281
	Number of years of schooling	3.7 (3.8)	280
Total	Family size	5.5 (1.9)	1,156
	Age in years	45.1 (13.7)	1,156
	Number of years of schooling	3.1 (3.6)	1,154

Source: Household baseline survey 2015–16

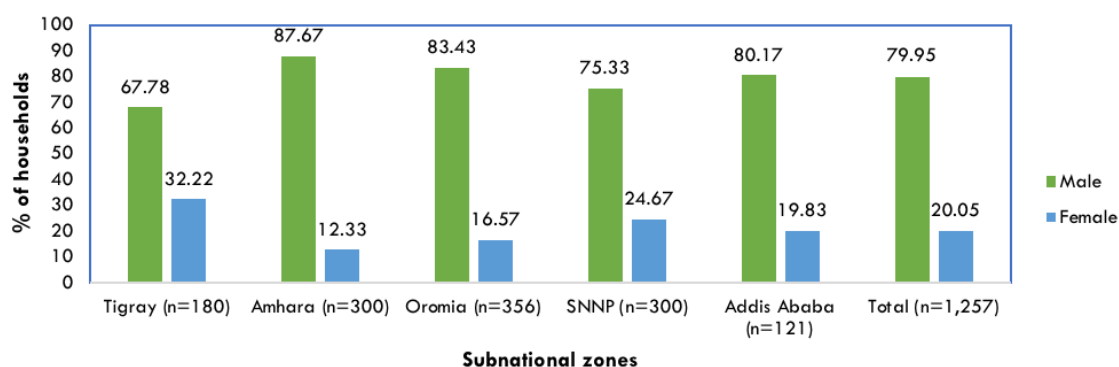
Note: The numbers in parentheses are standard deviations.



## Gender composition of the household heads

One of the major goals of the project is to appropriately engage female-headed households in the project activities. Thus, regarding the gender composition of the household heads surveyed, as presented in Figure 2, the results of the study reveal that 32.6% (58 of 180), 24.7% (74 of 300), 19.8% (24 of 121), 16.6% (59 of 356) and 12.3% (37 of 300) of the respondents are female-headed households in Tigray, SNNP, Addis Ababa, Oromia and Amhara regions, respectively. Overall, across the study subnational zones, the baseline data indicate that 252 (20%) of the sample households are female-headed. Generally, the proportion of female-headed households is 60% less than male-headed households, which is indicative of the dynamics of a male-dominated society. Female versus male-head households carry implications regarding decision-making, labour allocation and chicken ownership for the project to consider. These results also flagged potential issues of engaging women in the project. Therefore, for the on-farm study, 'householder' was adopted instead of household head, where a householder is defined as a person who devotes most of their time to chicken-production activities. In many cases, this will not be the male household head.

Figure 2: The percentage of female and male-headed chicken-keeping households in Ethiopia (2015–16).



Source: Household baseline survey 2015–16

## 3.2 Livelihood analysis

Based on the existing institutional management, institutional setup and agro-ecological situations, households adopt strategies and behavioural choices to achieve their livelihood objectives. In this section of the report, the different components of the livelihood analysis are provided, including household capital (physical and financial), household income, source of livelihood, asset ownership, in particular, livestock, and farm and domestic ownership, using the household asset index specifically to determine the contribution of livestock across the subnational zones. Moreover, based on a procedure recommended by a gender, livestock and livelihood indicators report (Njuki et al. 2011) and by adopting the Food and Agriculture Organization 2012 guidelines for measuring household and individual dietary diversity, we report the food security indicators (FAO 2012).

### Household income

Average total household income from all sources, quarterly average income, 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. The results indicate that average income varies across the project subnational zones. Total household income from all sources is considerably lower in Tigray and highest in Oromia subnational zones. Households in Tigray reported a mean quarterly income of ETB 2,011.20 while households in Oromia reported a mean quarterly income of ETB 6,795.10.

Households in the subnational zones commonly engage in poultry-production activities. The data analysis results indicate that in all subnational zones, income from poultry made an important contribution to the average household income. This contribution was more important in the peri-urban areas of Addis Ababa (38.4%) than in the other subnational zones. Across the sample households, the contribution of poultry to the total household income is 29.5%. The results of the analysis reveal that out of the total households (1,046), only 17.6% of women control income from at least one source (Table 2).

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

Income	Subnational zones					Total N=1,046
	Tigray n=165	Amhara n=270	Oromia n=266	SNNP n=260	Addis Ababa n=85	
Income from poultry	713.72 (2,050.5)	929.42 (2,603.7)	338.56 (754.74)	466.85 (1,523.2)	1,051.03 (2,594.8)	640.04 (1,932.02)
Total household income	2,011.22 (2,805.9)	2,982.34 (4,144.0)	6,795.13 (19,761.5)	2,124.26 (2,367.1)	4,728.13 (5,889.5)	3,727.33 (10,610.8)
Poultry/total income (%)	32.33	35.46	25.47	22.87	38.36	29.53
Women* control household income (%)	33.33	7.78	15.79	17.69	23.53	17.59

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

In an effort to comprehend the comparative importance of the different economic activities to the contribution of households' livelihood, sample households were asked to identify and prioritize the three most important (primary, secondary and tertiary) sources of their livelihoods. The analysis results presented in Table 3 indicate that households in the study subnational zones derive their livelihoods from many different sources. However, for the entire sample, 82.1% 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 was the third most important source of livelihood. This clearly indicates that livestock and poultry production are very important in the livelihood strategies of most rural farm households in the study subnational zones and simple reliance on crop farming seems necessary but not sufficient to sustain the livelihoods of the farming households. The results also clearly indicate that most of the sample households have mixed-farming systems, integrating crop production with livestock rearing. Three of the main livelihood sources are categorized among the farm household's livelihood sources. The contribution of other sources of livelihood is insignificant, for example, livestock trading, formal salary employment, livestock herder, self-employed and working as a daily wage labourer (Table 3).

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

Sources of livelihood	Rank of livelihood		
	Primary	Secondary	Tertiary
Crop farming	949 (82.1)	59 (6.2)	19 (3.1)
Livestock keeping	23 (2.0)	593 (62.0)	50 (8.2)
Poultry keeping	3 (0.3)	79 (8.3)	306 (50.4)
Livestock and livestock-product trading	5 (0.4)	22 (2.3)	18 (3.0)
Trading in non-livestock agricultural products	7 (0.6)	7 (0.7)	6 (1.0)
Formal salaried employment	38 (3.3)	17 (1.8)	6 (1.0)
Livestock herder	1 (0.1)	24 (2.5)	15 (2.5)
Self-employed trade	40 (3.5)	23 (2.4)	34 (5.6)
Self-employed services	26 (2.2)	21 (2.2)	12 (2.0)
Farm labourer	3 (0.3)	16 (1.7)	4 (0.7)
Fishing	0 (0)	0 (0)	1 (0.2)
Old/retired	12 (1.0)	5 (0.5)	5 (0.8)
Domestic work—own home	16 (1.4)	71 (7.4)	111 (18.3)
Not working/unemployed	2 (0.2)	3 (0.3)	2 (0.3)
Student/pupil	2 (0.2)	2 (0.2)	4 (0.7)
Disabled	10 (0.9)	2 (0.2)	1 (0.2)
Other	17 (1.5)	12 (1.3)	11 (1.8)
Total	1,156 (100.0)	957 (100.0)	607 (100.0)

Source: Household baseline survey 2015–16

Note: Row percentages in parentheses

## Asset ownership

### Livestock holdings

In the study subnational zones, as presented in Table 4, livestock species make significant contributions to the livelihoods of households and are considered productive assets which contribute meat, milk, eggs and traction as well as cash conversion. Moreover, in most instances, livestock is a source of self-reliance against income shocks. Livestock species that are generally kept include cattle, goats, sheep, donkeys, camels, horses and chickens. Tropical livestock unit (TLU) was used in order to make comparisons regarding the herd size across the different livestock species to produce a single number that indicates the amount of livestock owned. Based on a procedure recommended by a gender, livestock and livelihood indicators report (Njuki et al. 2011) the herd size was converted into TLU. The results of the analysis reveal that most of the households in all subnational zones own some livestock, but average holdings are small. Average ownership is dominated by cattle which contribute 1.84 TLUs, followed by sheep with 0.13 TLUs (Table 4). However, average livestock ownership varies across the project subnational zones.

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

Livestock species	Subnational zones					Total N=1,046
	Tigray n=165	Amhara n=270	Oromia n=266	SNNP n=260	Addis Ababa n =85	
Cattle	1.13 (1.17)	2.09 (1.65)	2.44 (2.11)	1.45 (1.05)	1.45 (2.18)	1.84 (1.75)
Sheep	0.16 (0.32)	0.22 (0.32)	0.08 (0.18)	0.09 (0.15)	0.07 (0.19)	0.13 (0.25)
Horses	0.00 (0.00)	0.00 (0.00)	0.00 (0.06)	0.00 (0.00)	0.00 (0.00)	0.00 (0.03)
Camels	0.01 (0.12)	0.02 (0.14)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.01 (0.08)
Chickens	0.10 (0.09)	0.07 (0.07)	0.12 (0.16)	0.07 (0.06)	0.06 (0.06)	0.09 (0.11)
Goats	0.22 (0.43)	0.05 (0.16)	0.14 (0.26)	0.04 (0.12)	0.06 (0.30)	0.10 (0.26)

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

Gender disaggregated ownership of livestock is one of the variables addressed in the baseline survey. Table 5 presents the average number of livestock by gender disaggregated ownership. The results of the data indicate that across the subnational zones, the most common livestock ownership pattern is joint ownership between the household head and spouse. Moreover, the overall results of the survey indicate that the next most frequent ownership pattern is ownership by the female members of the household. The average household herd sizes are also reported in Table 5. The mean herd size for cattle, sheep, goats, chickens and donkeys are 3.67, 1.29, 1.9 and 0.53, respectively.

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

Livestock ownership	Subnational zones					
	Tigray n=180	Amhara n=300	Oromia n=356	SNNP n=300	Addis Ababa n=121	Total n=1,257
Cattle men	0.11 (0.86)	0.01 (0.12)	0.24 (1.17)	0.51 (0.93)	0.00 (0.00)	0.21 (0.86)
Cattle women	0.19 (0.70)	0.11 (0.57)	0.29 (1.59)	0.73 (1.15)	0.44 (2.16)	0.35 (1.29)
Cattle joint	1.96 (2.28)	4.06 (3.40)	4.35 (4.23)	1.65 (2.09)	2.45 (4.07)	3.11 (3.54)
Cattle household	2.26 (2.33)	4.18 (3.31)	4.88 (4.22)	2.89 (2.10)	2.89 (4.36)	3.67 (3.50)
Sheep men	0.06 (0.82)	0.01 (0.18)	0.06 (0.46)	0.15 (0.66)	0.00 (0.00)	0.06 (0.52)
Sheep women	0.31 (1.61)	0.05 (0.37)	0.01 (0.11)	0.27 (0.75)	0.05 (0.55)	0.13 (0.76)
Sheep joint	1.24 (2.80)	2.17 (3.21)	0.77 (1.75)	0.50 (1.09)	0.68 (1.84)	1.10 (2.34)
Sheep household	1.61 (3.19)	2.24 (3.20)	0.83 (1.79)	0.92 (1.49)	0.73 (1.90)	1.29 (2.45)
Goats men	0.03 (0.45)	0.01 (0.13)	0.02 (0.25)	0.06 (0.34)	0.00 (0.00)	0.03 (0.28)
Goats women	0.23 (1.93)	0.00 (0.06)	0.04 (0.36)	0.12 (0.58)	0.04 (0.45)	0.08 (0.82)
Goats joint	1.96 (3.91)	0.48 (1.60)	1.34 (2.60)	0.26 (0.91)	0.57 (2.95)	0.89 (2.47)
Goats household	2.22 (4.27)	0.49 (1.61)	1.40 (2.62)	0.43 (1.20)	0.61 (2.98)	0.99 (2.60)
Donkeys men	0.02 (0.17)	0.00 (0.00)	0.00 (0.00)	0.08 (0.28)	0.00 (0.00)	0.02 (0.16)
Donkeys women	0.05 (0.24)	0.01 (0.08)	0.03 (0.25)	0.09 (0.34)	0.06 (0.35)	0.04 (0.26)
Donkeys joint	0.64 (0.93)	0.69 (0.99)	0.43 (0.83)	0.17 (0.47)	0.45 (0.99)	0.46 (0.86)
Donkeys household	0.71 (0.92)	0.70 (0.99)	0.46 (0.86)	0.34 (0.60)	0.50 (1.03)	0.53 (0.88)
Horses 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)
Horses 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)
Horses joint	0.00 (0.00)	0.00 (0.00)	0.01 (0.07)	0.00 (0.00)	0.00 (0.00)	0.00 (0.04)
Horses household	0.00 (0.00)	0.00 (0.00)	0.01 (0.07)	0.00 (0.00)	0.00 (0.00)	0.00 (0.04)
Chickens household <sup>4</sup>	9.98 (8.96)	7.22 (7.46)	11.90 (15.9)	7.00 (6.22)	6.48 (5.64)	8.82 (10.66)

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 (2010) grants, farm and household domestic asset indices were first computed and then asset ownership in terms of the assets index were compared across the three types of household ownership (male, female and joint). The overall results presented in Table 6 indicate that compared to women, men owned more farm and household assets. The indices, for example, land male (1.5) vs. land female (0.3), farm implement male (5.3) vs. farm implement female (1.9), transport male (2.8) vs. transport female (2.54) domestic asset male (6.3) vs. domestic asset female (3.6), proved that the important household assets are owned by men compared to women. However, joint ownership was by far higher than men and women ownership of these productive assets (Table 6).

The contribution of livestock to the household base was also analysed. The results presented in Table 6 indicate that the contribution of livestock to the household asset index varies across subnational zones, ranging from 17.63% in Addis Ababa to up to 48.91% in SNNP. However, for the entire sample, on average livestock contribution to the household asset index was found to be 38.52%.

<sup>4</sup> Due to a lack of gender disaggregated data, the chicken data is presented at household level only.

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

Asset ownership	Subnational zones					
	Tigray n=180	Amhara n=300	Oromia n=356	SNNP n=300	Addis Ababa n=121	Total N=1,257
Land male	3.89 (32.65)	0.25 (0.95)	2.45 (4.34)	0.95 (1.75)	0.09 (0.7)	1.55 (12.6)
Land female	0.48 (0.90)	0.27 (0.92)	0.62 (2.35)	0.20 (0.83)	0.33 (1.46)	0.39 (1.51)
Land joint	1.09 (1.56)	5.15 (53.5)	1.12 (2.71)	0.55 (1.09)	1.21 (2.67)	1.95 (26.2)
Farm implements male	2.13 (10.13)	0.59 (5.83)	10.74 (17.0)	7.52 (10.8)	0.47 (2.71)	5.33 (12.3)
Farm implements female	2.80 (12.43)	1.01 (7.09)	2.73 (11.7)	0.83 (4.22)	3.39 (15.7)	1.94 (10.0)
Farm implements joint	17.79 (26.68)	33.96 (31.4)	29.09 (38.3)	5.75 (11.7)	28.66 (44.0)	23.02 (33)
Transport assets male	0.22 (2.06)	0.00 (0.00)	7.47 (31.2)	2.88 (13.6)	0.00 (0.00)	2.83 (18.1)
Transport assets female	0.00 (0.00)	0.00 (0.00)	2.18 (18.8)	0.22 (2.96)	19.44 (178)	2.54 (56.4)
Transport assets joint	0.00 (0.00)	8.04 (67.1)	22.48 (97)	2.43 (10.6)	13.77 (128)	10.19 (73)
Domestic assets male	3.01 (6.46)	6.80 (12.5)	8.06 (11.8)	2.68 (4.60)	13.90 (17)	6.32 (11.3)
Domestic assets female	2.09 (6.20)	3.34 (10.2)	3.80 (9.36)	0.94 (3.69)	12.40 (18)	3.59 (9.98)
Domestic assets joint	2.64 (7.73)	32.72 (30)	7.07 (13.0)	2.98 (8.89)	24.95 (30)	13.30 (23)
Household asset index	74.74 (60.44)	143.65 (126.3)	161.05 (143.5)	66.22 (44.3)	156.39 (273.9)	121.46 (139.6)
Livestock contribution to household asset index (%)	39.83	36.49	37.92	48.91	17.63	38.52

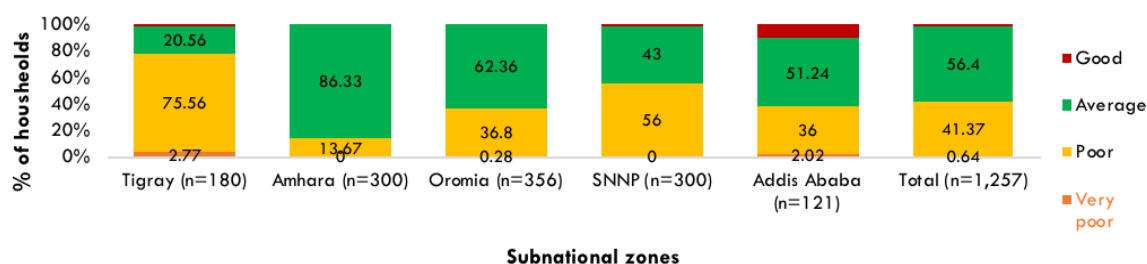
Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

## Quality of housing

Based on the 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 households. CHI uses the external housing conditions such as number of rooms, floor, wall and roofing material 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. Thus, based on CHI, the quality of housing conditions of the sample households is classified as very poor, poor, average and good quality (Figure 3). The results of the analysis indicate that in Amhara (86.33%), Oromia (62.36%) and Addis Ababa (51.24%) of the households were living in average quality housing, whereas the majority of households in Tigray (75.56%) and SNNP (56%) were living in poor quality houses (Figure 3). The overall results of the sample households indicate that 0.64%, 41.37%, 56.4% and 1.59% of the households were living in very poor, poor, average and good quality housing conditions, respectively (Figure 3).

Figure 3: Farmers' housing conditions in Ethiopia (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 for the household and with an important contribution to food security. Livestock mainly provide milk, meat and eggs which increase a household's consumption of animal-sourced food. Moreover, the contribution of livestock to food security can be related to income from sale of livestock and livestock products, which are often used for purchase of necessary household additional food items from the market. Livestock are also a wealth indicator and generally play a very crucial role in the provision of transportation services, trading activities and for 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, or receive as a gift to meet the family members' food nutritional requirements. The months of adequate household food provisioning was used as proxy measure for measuring food access (Table 7).

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

Characteristics	Subnational zones					
	Tigray n=180	Amhara n=299	Oromia n=344	SNNP n=300	Addis Ababa n=121	Total n=1,244
Proportion of food- adequate households (%)	87	92	81	79	96	85
Average months of adequate food	10.40 (4.09)	11.00 (3.33)	9.66 (4.76)	9.48 (4.90)	11.50 (2.40)	10.23 (4.26)

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. The 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, 96%, 92%, 87%, 81% and 79% of the respondents in Addis Ababa, Amhara, Tigray, Oromia and SNNP, respectively, reported that they had enough food in the last 12 months (Table 7). The overall sample results indicate that 85% of the sample respondents reported that they had adequate food in the last 12 months for their household.

#### Individual 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 of food groups consumed within and across the different groups rather than the number of different

foods consumed during a 24-hour recall period divided by the total number in the household. The HDDS can also be adapted and used as an IDDS, which is used as a proxy measure of the nutritional quality of an individual's diet. It reveals the concept that increasing foods varieties and different food groups in the diet indicate adequate intake of essential nutrients, and helps 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), 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 for 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: Individual dietary diversity score in Ethiopia (2015–16)

Individual household members	Subnational zones					
	Tigray	Amhara	Oromia	SNNP	Addis Ababa	Total
Children (< 5 years)	4.15 (1.42) (n=67)	6.70 (1.35) (n=177)	6.67 (1.86) (n=100)	4.78 (2.02) (n=105)	6.94 (1.50) (n=31)	5.93 (1.95) (n=480)
Women (reproductive age)	4.90 (1.31) (n=159)	6.36 (1.42) (n=285)	6.02 (2.27) (n=265)	5.18 (2.11) (n=237)	7.03 (1.10) (n=105)	5.85 (1.92) (n=1,051)
Men	4.84 (1.35) (n=154)	6.37 (1.43) (n=276)	5.71 (2.39) (n=273)	5.39 (2.16) (n=220)	7.07 (1.13) (n=67)	5.78 (1.98) (n=990)

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 in the subnational zones, the IDDS was higher in Addis Ababa for index child, women and men with an average score of 6.94, 7.03 and 7.70, respectively, followed by Amhara. The IDDS for men, women and children were lowest in Tigray with an average score of 4.84, 4.90 and 4.15, respectively. Across the subnational zones, the IDDS was found to be higher for index children (5.93) than men and women.

## 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 get more weight than low-nutrient foods. FCS was computed for the men, women and children. An FCS of 0–21 is considered poor, 21.5–35 is considered borderline, while an FCS greater than 35 is considered acceptable.

Generally, the results presented in Table 9 indicate that the FCS was highest among children across all the subnational zones. The highest average FCS was reported for children in Addis Ababa, which had a mean FCS score of 71.60 and was lowest in SNNP with a mean of 38.38. Likewise, FCS for men, women and children were highest in Addis Ababa and lowest in SNNP. Across all subnational zones, the mean value of the FCS was above 35, which is considered acceptable.

Table 9: Food consumption score in Ethiopia (2015–16)

Household members	Subnational zones					Total
	Tigray	Amhara	Oromia	SNNP	Addis Ababa	
Children (<5 years)	57.19 (19.12) (n=67)	65.44 (17.92) (n=177)	69.97 (21.57) (n=100)	38.38 (20.38) (n=105)	71.60 (19.45) (n=31)	59.71 (22.85) (n=480)
Women (reproductive age)	54.68 (15.07) (n=159)	59.55 (16.49) (n=285)	59.91 (20.69) (n=265)	35.39 (15.62) (n=235)	60.88 (16.67) (n=105)	53.62 (19.93) (n=1,049)
Men	55.82 (16.06) (n=154)	59.47 (16.52) (n=276)	57.55 (21.12) (n=273)	37.21 (14.73) (n=219)	64.22 (15.68) (n=67)	53.76 (19.62) (n=989)

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 Oromia and lowest in SNNP subnational zones. On average, households in Oromia consumed 2.39 birds, while in SNNP the number was 1.11. Next to Oromia, Tigray is the second-highest subnational zone in bird consumption where on average households consumed 2.20 birds. The general average across the subnational zones indicates that households consumed on average 1.78 live birds. The small average number of birds consumed is expected given that households rely upon sale of live birds to meet their immediate cash needs.

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

Poultry and poultry products	Subnational zones					Total n=737
	Tigray n=146	Amhara n=178	Oromia n=150	SNNP n=166	Addis Ababa n=97	
Birds produced for consumption	1.82 (1.47)	1.56 (3.08)	1.73 (3.97)	0.68 (1.04)	0.85 (0.96)	1.35 (2.54)
Birds purchased	0.38 (0.97)	0.33 (0.73)	0.66 (1.58)	0.43 (0.86)	0.34 (0.64)	0.43 (1.03)
Total birds consumed	2.20 (1.70)	1.89 (3.07)	2.39 (4.94)	1.11 (1.29)	1.19 (0.95)	1.78 (2.92)
Eggs produced	23.90 (32.12)	11.89 (13.87)	23.11 (31.51)	14.80 (12.51)	36.99 (32.79)	20.51 (26.28)
Eggs purchased	0.97 (5.29)	0.84 (4.13)	2.57 (6.68)	0.92 (3.88)	5.44 (15.56)	1.84 (7.48)
Total eggs consumed	24.87 (32.10)	12.73 (14.04)	25.67 (31.14)	15.72 (12.41)	42.43 (32.24)	22.35 (26.57)

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

The data on egg consumption is also reported in Table 10. The results demonstrate that there is a wide variation in consumption of eggs between subnational zones. Egg consumption was high in Addis Ababa and low in Amhara and SNNP subnational zones. The average egg consumption in Addis Ababa was 42 eggs and in Amhara, the average egg consumption was 13 eggs. Across the subnational zones, the average egg consumption was 22 eggs.



## 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 in the project. At least two years of chicken-keeping experience is required to be an on-farm study participant household in the project. As indicated in Table 11, the results reveal that the mean duration (years) of chicken keeping was highest in Tigray at 17.8 years and the lowest in peri-urban Addis Ababa at 8.6 years. This indicates that the duration of poultry keeping is not uniform across the subnational zones. Across the sampled households, the mean duration of chicken keeping was 13.3 years. This information helps the project to understand the project target households in terms of knowledge level for targeting of training. The study also revealed that the majority of the 1,223 households (97.3%) kept poultry for at least two years.

Table 11: Mean duration of chicken-keeping experience by households in years in Ethiopia (2015–16)

Subnational zones	Observations (n)	Mean	Max
Tigray	180	17.8 (12.1)	60
Amhara	300	17.4 (11.8)	60
Oromia	356	10.4 (7.8)	40
SNNP	300	11.7 (9.6)	50
Addis Ababa	121	8.6 (7.6)	35
Total mean (standard)	1257	13.3 (10.5)	60

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

### Flock size per household

The study also examined the average flock size per household (Table 12). The average number of chickens in all the sampled subnational zones was approximately 9 chickens per household. Of all the sampled households that kept chickens, about 74.24% kept less than 11 chickens; 24.62% of the households kept 6-10 chickens. Only a small proportion, approximately 25%, had more than 10 chickens. The multiple response analysis also indicated that, in terms of breeds, the majority (77%) of the sample households kept local chickens, while 14% of the sample households kept only the exotic breeds. However, only a small proportion of the households (9%) kept only the improved locals, improved exotic and crossbreeds.

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

Subnational zones	Observations (n)	Average number of chickens per household
Tigray	180	10 (8.9)
Amhara	300	7.22 (7.4)
Oromia	356	11.8 (15.9)
SNNP	300	7.0 (6.2)
Addis Ababa	121	6.4 (5.6)
All subnational	1,257	9.0 (10.6)

Source: Household baseline survey 2015–16

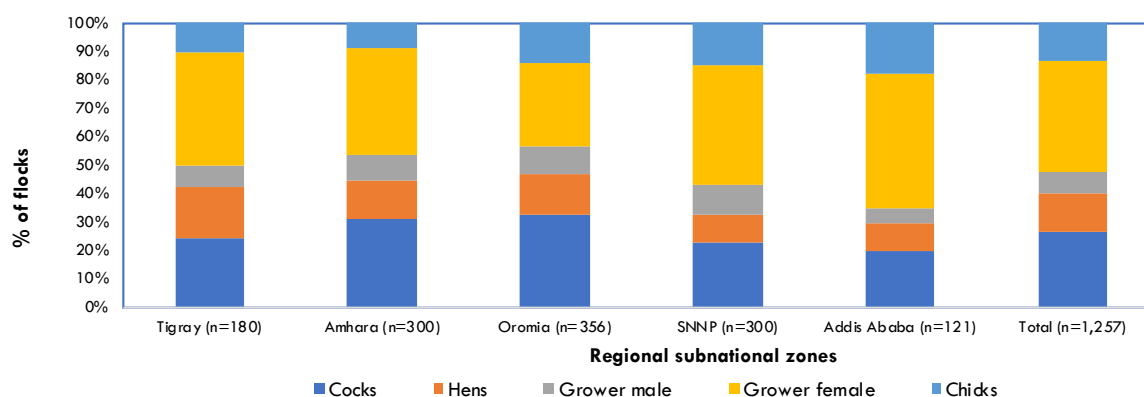
Note: The numbers in parentheses are standard deviations.

The average flock size per household differs among the subnational zones (Table 12). The highest flock size per household were reported in Oromia (11.8) and Tigray (10), whereas flock size per household was lowest in Addis Ababa (6.5). It should be noted that for this study, households with 50 or more adult chickens were excluded as the project focuses on smallholders.

## Flock composition per household

The structure and composition of flocks in the study households are dominated by hens followed by chicks in all study subnational zones except Oromia. In Oromia, the flock composition was dominated by chicks followed by hens. Overall, the results indicate that the composition of flocks was dominated by hens followed by chicks. As indicated in Figure 4, hens constitute the largest share (39%) of the flocks. The findings also indicate that the proportion of chicks is high (27%) as compared to grower males (13%), cocks (13%) and grower females (8%). Nevertheless, about 66% of the households did not have a chick in their flock. A high number of chicks suggests that households are using flocks for flock propagation. The ratio of cocks to hens is (1:3). Approximately 52% of flocks consist of female chickens (hens and grower females), which probably implies the production and reproductive objectives of households. In addition, the results also imply households' desire for eggs.

Figure 4: Chicken-flock composition per household across sampled subnational zones in Ethiopia (2015–16).



Source: Household baseline survey 2015–16

## Reasons for keeping chicken

Table 13 shows the rank indices of the purposes and objectives of keeping chickens by the sample households across the subnational zones.

Table 13: Ranking of chicken-production objectives and purposes by households in Ethiopia (2015–16)

Production objectives	Rank index of chicken-production purposes and objectives				
	Tigray	Amhara	Oromia	SNNP	Addis Ababa
Meat consumption	0.18	0.05	0.21	0.04	0.05
Egg consumption	0.10	0.08	0.23	0.30	0.38
Meat sale	-	-	0.02	0.01	0.03
Egg sale	0.36	0.33	0.22	0.38	0.33
Chick sale	0.09	0.08	0.18	0.10	0.07
Ceremonies/festivals	0.08	0.12	0.02	0.03	0.03
Give away	-	-	-	-	-
Cock fighting	-	-	-	-	-
Live-adult chicken sale	0.18	0.33	0.11	0.14	0.10

Source: Household baseline survey 2015–16

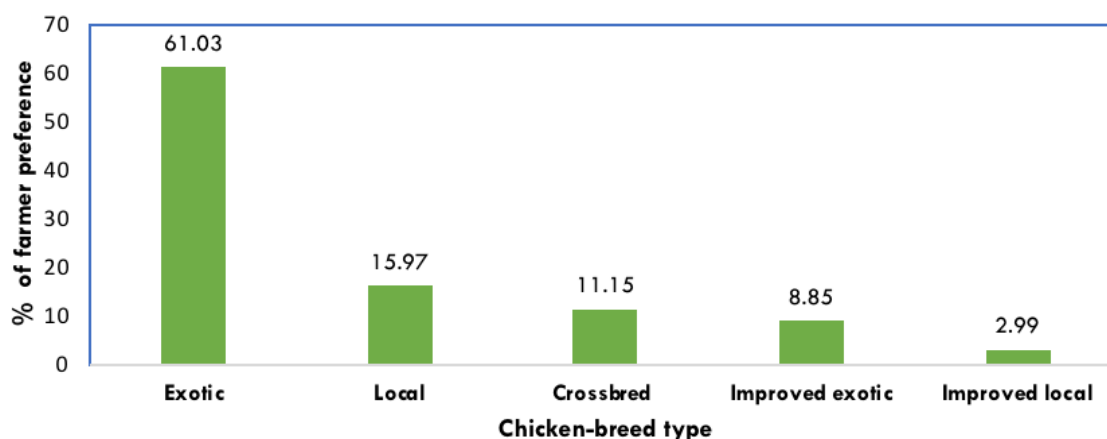
Note: Index =  $[(3 \times \text{number of households ranking as first} + 2 \times \text{number of households ranking as second} + 1 \times \text{number of households ranking as third}) \text{ for each objective}] / [(3 \times \text{total number of households ranking any purpose first} + 2 \times \text{total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

The results from this study indicate that chickens are kept by households for multiple purposes and objectives. The primary reason for keeping chickens in Addis Ababa, Oromia and SNNP was reported as egg consumption and egg sale with their respective indices of (0.38) and (0.33) in Addis Ababa, (0.22) and (0.23) in Oromia, and (0.38) and (0.3) in SNNP, while egg sale and live-adult chicken sale are the primary reasons for keeping chicken both in Amhara and Tigray subnational areas with rank indices of (0.33) and (0.33) in Amhara, and (0.36) and (0.18) in Tigray. Egg sale is the main reason and objective of keeping chickens across all subnational areas which implies the need for egg-type breeds. The results also imply that chickens are kept for the dual purposes (meat and eggs) in Tigray and Oromia. Generally, the results indicate that farmers identified objectives that have relatively tangible benefits such as a source of income and consumption. Moreover, the results imply the growing understanding of households about the importance of egg consumption to meet nutritional needs. Increasing population and income in the country indicate increased need for chicken and other poultry production and productivity to meet the growing demand. None of the households responded positively for the objectives of cockfighting and give away/gifting, which indicates that both are not common cultural practices in Ethiopia. However, functions like meat sale and ceremonies/festivals also received relatively low rankings.

### Farmers' chicken-breed preference

In this study, whether the households keep all breed types or not, we explored households' preferences for different breed types of chicken. The multiple response analysis results demonstrate that the majority of the households (61.03%) preferred the exotic breeds over the other chicken-breed types (Figure 5). The local breed, which is considered less productive but well adapted, is ranked the second-most preferred breed over other breeds (Figure 5). The crossbreds lie in between. However, households' willingness-to-pay analysis will be necessary for all ACGG sites in order to determine farmers' real demand for exotic chicken breeds and their willingness to pay for the breeds. The results influence the selection of tropically-adapted exotic, local and improved local. Therefore, the information obtained from the baseline data informed the design of the longitudinal study monitoring on preferences.

Figure 5: Chicken-breed preferences by farmers in Ethiopia (2015–16).



Source: Household baseline survey 2015–16

The reason for the preference of exotic breeds are many, however, high egg production, increased weight for meat production, and good physical appearance are the major reasons with percentage responses of 29.8, 12.05 and 10.86, respectively (Table 14). The results may imply household commercial and more productivity intentions.

Table 14: Household reasons for breed preference in Ethiopia (2015–16)

Reason for preference	%*
Produces high number of eggs	29.8
Large body size and weight for meat	12.05
Beautiful/good physical appearance	10.86
Less sickness	8.61
Feed efficient	8.29
Produces chicks with high survival rate	7.44
Produces eggs with harder/thicker shell	7.26
Produces better tasting eggs	6.12
Lives a long time (longevity)	4.21
The meat tastes better	3.13
Good fighter	0.29

Source: Household baseline survey 2015–16

\*The percentage is based on multiple response analysis.

## Trait preferences

Households' trait preferences regarding the selection of good cockerels and hens irrespective of whether they select specific chickens for breeding are presented in Table 15. For good cockerels, good physical appearance and large body size and weight for meat production were the attributes ranked first and second in all subnational zones except SNNP with an index of (0.46) and (0.41) in Tigray, (0.42) and (0.23) in Amhara, (0.29) and (0.36) in Oromia and (0.57) and (0.23) in Addis Ababa, while in SNNP better meat taste and feed efficiency were attributes ranked first and second with indices of (0.21) and (0.14), respectively. For hens, the production of a high number of eggs was ranked first in all subnational zones with indices of 0.58, 0.56, 0.53, 0.53 and 0.48 for Addis Ababa, Oromia, Amhara, SNNP and Tigray, respectively. This result reinforces the need for egg-type breeds.

Table 15: Attributes/qualities of good cockerels and hens in Ethiopia (2015–16)

Qualities/attributes of a good chicken	Rank index of qualities/attributes of a good chicken									
	Cockerels					Hens				
	Tigray	Amhara	Oromia	SNNP	Addis Ababa	Tigray	Amhara	Oromia	SNNP	Addis Ababa
Large body size and weight	0.41	0.23	0.36	0.04	0.23	0.08	0.03	0.03	0.01	0.01
Less illness	0.01	0.22	0.08	0.09	0.08	0.02	0.13	0.06	0.07	0.07
Meat tastes better	0.01	0.01	0.06	0.21	0.03	0.00	0.01	0.00	0.00	0.00
Good physical appearance	0.46	0.42	0.29	0.06	0.57	0.26	0.05	0.10	0.05	0.08
Lives a long time	0.01	0.10	0.04	0.06	0.04	0.01	0.02	0.01	0.02	0.00
Good fighter	0.07	0.00	0.02	0.05	0.01	0.01	0.00	0.00	0.00	0.00
Feed efficient	0.02	0.01	0.09	0.14	0.03	0.03	0.06	0.02	0.08	0.03
Produces a lot of eggs	-	-	-	-	-	0.48	0.53	0.56	0.53	0.58
Produces better tasting eggs	-	-	-	-	-	0.00	0.00	0.05	0.06	0.05
Produces eggs with harder/thicker shell	0.01	-	-	0.01	0.01	0.01	0.07	0.09	0.06	0.01
Produces chicks with high survival rate	-	-	0.05	0.33	-	0.09	0.09	0.08	0.13	0.18

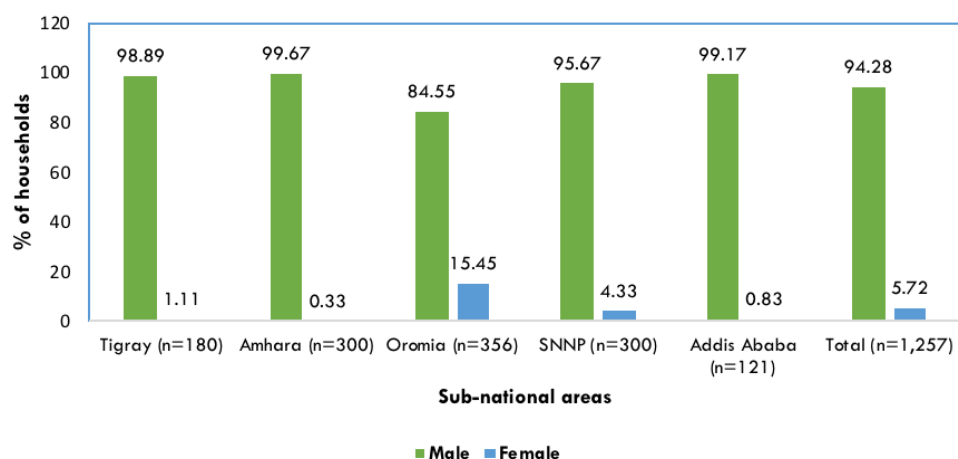
Source: Household baseline survey 2015–16

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

## Existing practice of supplementary feed

Supplementary feed is a major limiting factor in village chicken production. Supplementary feed in this study is defined as ‘any feed not obtained from scavenging’. As indicated in Figure 6, the majority of households (94.28%) have had experience of providing supplementary feeding to their chickens at any time of the year. This implies that households understand the importance of supplementation to enhance production and productivity. The results also support the households’ need to supplement the on-farm strains. 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 additional numbers of chicken and higher consuming breeds.

Figure 6: Existing practice of provision of supplementary feed for chickens in Ethiopia (2015–16).



Source: Household baseline survey 2015–16

## 3.5 Chicken labour allocations

The average time spent in minutes for all chicken activities by the different household members is presented in Table 16. The results of the data indicate that all members of the household have spent time on chicken activities. However, the time spent by the different household members varies across the subnational zones. Nevertheless, the overall results indicate that the average time spent was higher for adult female members of the household than for other household members. On average, adult women spent 90.02 minutes in a week on chicken activities. Next to women, children spent more time than adult males and hired labour. On average, children spent 44.85 minutes per week on all chicken activities. The results imply that care of chickens and chicken management are the responsibility of women in the household. However, children in the household play a considerable role in chicken care and management.

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

Household members	Subnational zones					
	Tigray n=180	Amhara n=300	Oromia n=356	SNNP n=300	Addis Ababa n=121	Total n=1,257
Adult males	20.08 (74.48)	78.54 (169.82)	38.79 (76.20)	31.35 (48.61)	10.45 (30.92)	41.09 (102.29)
Adult females	96.22 (92.78)	123.07 (147.42)	94.38 (91.05)	53.80 (93.16)	77.70 (108.74)	90.20 (111.98)
Children	12.23 (35.26)	117.93 (320.64)	39.87 (100.93)	14.18 (45.36)	2.83 (13.62)	44.85 (172.83)
Hired males	0.00 (0.00)	0.00 (0.00)	1.95 (9.02)	0.38 (3.83)	0.02 (0.18)	0.64 (5.21)
Hired females	0.03 (0.37)	0.09 (1.14)	7.27 (25.72)	0.17 (1.85)	0.00 (0.00)	2.12 (14.09)

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

## 3.6 Chicken marketing

### Live-bird marketing

The market channels, 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 17. Generally, the results of the data indicate that the village market is the largest market channel, which 278 households used for selling chickens in the last three months. On average, 2.45 birds were sold in the village market channel. The second-largest channel in terms of number of households used is the city market channel, which 145 households used. However, in terms of the number of birds sold, the city market channel is the highest compared with other marketing channels. On average, 2.6 birds were sold in this channel. Individual (fellow farmers) and traders market channels are also important outlets which, respectively, on average 2.2 and 2 birds were sold. Compared with other market outlets, a smaller number of households used and a smaller number of birds were channelled to traders. Out of the total sample households, 441 households used the different market channels. Overall, on average 2.48 birds were sold in the different market outlets for which households received an average sales revenue of ETB230.35 (Table 17).

Table 17: Marketing of chicken (last three months) in Ethiopia (2015–16)

Description of items	Market channel and household numbers using the channel				
	Individual n=10	Traders n=8	Village market n=278	City market n=145	Total n=441
Number of birds sold	2.20 (1.48)	2.00 (0.53)	2.45 (1.76)	2.60 (1.99)	2.48 (1.82)
Total sales revenue	288.50 (177.45)	345.63 (300.83)	225.40 (188.20)	229.47 (199.79)	230.35 (194.37)
Transport cost	0.00 (0.00)	0.00 (0.00)	2.55 (10.13)	1.59 (5.81)	2.13 (8.72)

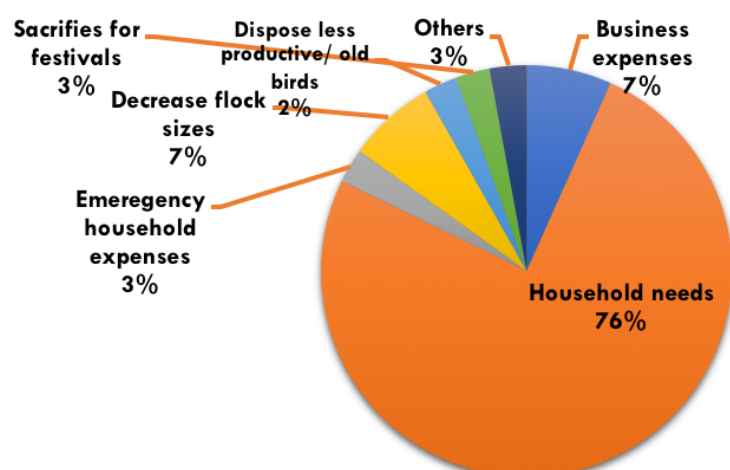
Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.

### Reasons for selling live birds

This study explored the reasons why households sell their chickens. Households described seven essential reasons. As presented in Figure 7, the majority of the sample households (76%) reported that the main reason for selling chicken is to use the money for covering household basic needs. Decrease flock size (7%), business purposes (7%), emergency household needs (3%), sacrifices for festivals (3%) and disposal of less productive birds (2%) were the other reasons for selling birds (Figure 7).

Figure 7: Household reasons for selling chicken in Ethiopia (2015–16).

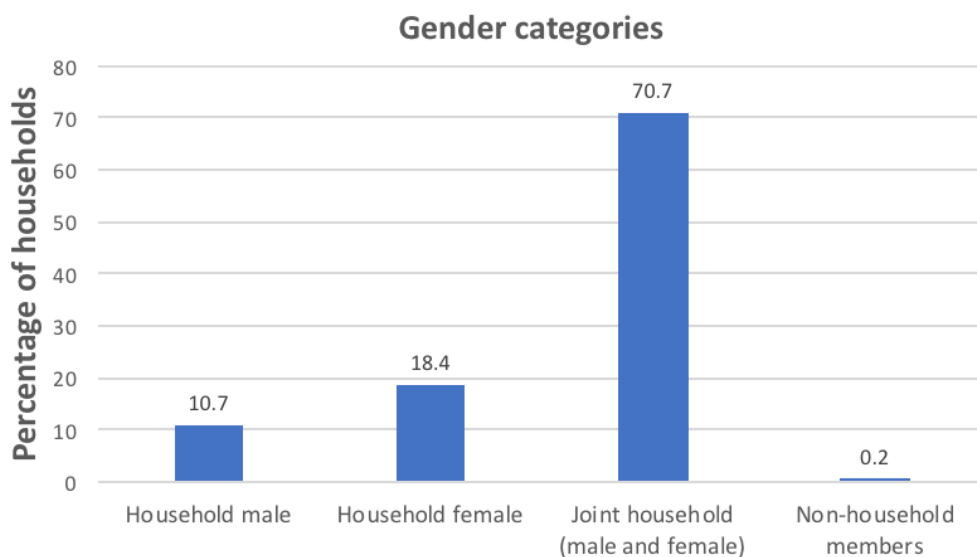


Source: Household baseline survey 2015–16

## Gender role in live-bird sale

The distribution of decision-making regarding who decides to sell chickens was explored in the study. The results of the analyses presented in Figure 8 indicate that joint household (male and female) is responsible for more than 70% of decisions regarding live-bird sale. The household male alone and the household female alone are responsible for 10.7% and 18.4%, respectively, of the decisions regarding live-bird sale. The results imply that next to joint decision-making, women have the highest decision power regarding live-bird sale. The other nonhousehold members had very little decision-making role with regard to the number of birds sold in the last three months.

Figure 8: Role of gender in selling chicken in Ethiopia (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 18. Generally, the results of the data indicate that the village market is the largest market channel, which 393 households used for selling eggs per week. On average, 9.23 eggs were sold in the village market outlets. The second-largest channel in terms of number of households used is the city market channel, which 219 households used. However, in terms of the number of birds sold, the city market channel is the highest compared with other marketing channels. On average, 11.9 eggs were sold in this channel. Individual (fellow farmers), shop and traders market channel are also important market outlets in which, on average 7.85, 9.64 and 14.07, respectively, eggs were sold. Moreover, the results presented in Table 18 indicate that out of the total sample households, 711 households used the different market channels per week.

The results presented in Table 18 also indicate that, overall, on average 10 eggs were sold in the different market outlets per week where households received an average sales revenue of ETB 30.91. We also assessed the average egg price per week in the different market outlets. The results of the data presented in Table 17 indicate that the average price for eggs varies depending on the market channels, ranging from ETB2.44 to 2.97. The lowest average egg price was reported in the village market outlets, where on average households sold eggs at ETB 2.44. The highest egg price was obtained when households sold eggs in the shop where on average they sold for ETB2.97. Overall, households on average received ETB2.49 per egg.

Table 18: Egg marketing (per week) in Ethiopia (2015–16)

Description	Market channel and household numbers using the channel					
	Individual n=26	Traders n=45	Village market n=393	City market n=219	Shop n=28	Total N=711
Egg price	2.74 (0.46)	2.51 (0.30)	2.44 (0.40)	2.50 (0.39)	2.97 (0.43)	2.49 (0.41)
Times sold per week	1.50 (1.21)	1.09 (0.29)	1.30 (0.62)	1.15 (0.61)	1.14 (0.36)	1.24 (0.63)
Average eggs sold	7.85 (6.16)	9.64 (7.85)	9.23 (7.64)	11.19 (7.57)	14.07 (9.24)	10.00 (7.73)
Average egg sales	30.89 (24.66)	27.31 (25.71)	28.67 (31.88)	33.51 (33.39)	47.78 (37.73)	30.91 (32.20)

Source: Household baseline survey 2015–16

Note: The numbers in parentheses are standard deviations.



## 4. Constraints and opportunities

Based on the results of the baseline survey, constraints and opportunities of chicken production were identified in order to inform ACGG future research and development interventions. As described in this report, farmers prefer the exotic breeds over other breeds irrespective of whether they keep the breeds or not. However, a main constraint is the lack of evidence regarding the real demand for exotic breeds, including households' willingness to pay for the new breeds of chicken. An additional constraint may be the small proportion of female-headed households, although the data indicate that women assume primary chicken care responsibilities. Opportunities identified based on data analysis include household practical experience of keeping local, exotic and improved breeds, which implies that households will be able to care appropriately for exotic breeds distributed as part of the project. An additional opportunity is households' existing practice of giving supplementary feed for their chickens, which could mean that ACGG can implement the longitudinal study with minimal training of households regarding the preparation of supplementary feed. Finally, current flock composition suggests that households are familiar with the management of different classes and types of chicken, and therefore may require minimal training on the care of exotic breeds which are a focus of the interventional study.

## 5. Conclusion

This short summary report of the ACGG baseline survey describes the baseline situations in subnational zones in Ethiopia where the ACGG project will be implemented. Most importantly, it includes baseline characteristics of randomly selected households from all sampled subnational zones. Since the households are representative, the results obtained from this study provide the underlying situations in the project villages and a basic reference for the design of the on-farm study across the project subnational areas regarding woman's level of participation, flock composition, chicken supplementary feed, smallholder farmers' preference for different breeds of chicken and farmers' perception of the good qualities of cocks and hens. First, for the on-farm study, we highly recommended that female-headed and poor households should be appropriately represented since their baseline representation is inadequate. Therefore, for the on-farm study, the householder was adopted instead of the household head, where a householder is defined as the person who actively engages in chicken-production activities. In many cases, this will not be the household head, but is rather a household female. Second, the survey results allow us to fully appreciate the realities on the ground regarding chicken-keeping experience, housing and supplementary feed and to incorporate this knowledge into the on-farm study design. Third, the study revealed that farmers prefer the exotic breeds together with local breeds, which reflects the potential demand for exotic breed increases in the future. Lastly, the study revealed that care of chickens and chicken management are the responsibility of women in the household. This reinforces that the on-farm interventional study should target women household members with the objective of benefiting women and their households through increased quality and production of chicken flocks.

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ISBN: 92-9146-562-6



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