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# Mapping Poultry Value Chain Functions in Adwa Wereda, Central Zone of Tigray, Ethiopia

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**Abstract**
The objective of this study was to map poultry value chain functions in Adwa wereda, Central Zone of Tigray, Ethiopia. A total of 200 poultry producing sample households from four potential poultry producing Tabias of the wereda were surveyed. Descriptive statistics such as t-test, and chi-square were employed to examine the existence of statistically significant differences between the poultry market participants and non-participants. The core process, main actors and functions were identified in the poultry value chain map. In the poultry value chain map, 6 core processes (input supply, production, collection and transporting, marketing, processing and consumption) were identified.
**Keywords**: Value Chain Mapping, Value Addition, Profit Margin, Econometric

## 1. Introduction

Livestock production is an integral part of Ethiopia's agricultural sector and plays a vital role in the national economy. This livestock sector has been contributing considerable portion to the economy of the country, and still promising to rally round the economic development of the country. Livestock contributes about 20% of the GDP, supporting the livelihoods of 70% of the population and generating about 11% of annual export earnings (SPS-LMM, 2010). Ethiopia has an estimated 52.13 million cattle, 24.2 million sheep, 22.6 million goats, and 44.89 million poultry birds, which exists in private holdings (CSA, 2012).

The poultry sector in Ethiopia can be categorized into three major production systems. These are village or backyard poultry production systems, small-scale semi-commercial poultry production systems, and commercial poultry production systems (Bush, 2006). The poultry sector is almost exclusively dominated by backyard and small-scale production using limited inputs in production and which is targeted for either self-consumption or the market (Ayele *et al.*, 2010).

The modern poultry sector in Ethiopia comprises a few small to medium scale semi-commercial producers and even fewer large-scale commercial farms. These producers, especially large-scale farms, have strong backward and forward linkages in the economy (Alemu *et al.*, 2008). Poultry production and productivity remains low despite the rapid population growth of the country in general and in Tigray in particular. Therefore, poultry productivity and marketing problems can be solved by creating functional value chain in the study area.

## 2. Materials and Methods

### 2.1 Description of the Study Area

Adwa wereda is located between 14º 19' 25" North latitude & 39º 4' 27" East longitude in central zone of Tigray. It is found about 925 km North of Addis Ababa and 235 km west of Mekelle. The distance of the study Tabias (Endamariam Shewito, Wedikeshi, Betehanes and Debregenet) from Adwa Town are 14 km, 6 km, 10 km and 18 km respectively.

 

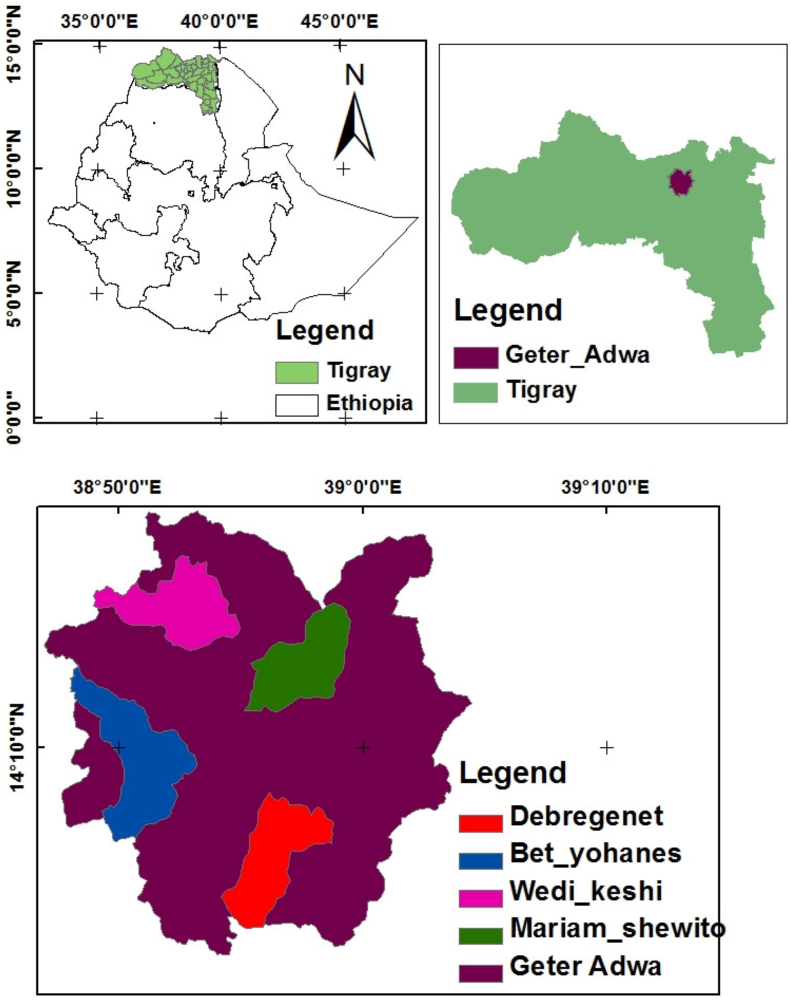


Figure 1: Map of the study area

**Altitude, Temperature and Rainfall**

The altitude of Adwa wereda ranges from 1805-2258 masl. The temperature of the area ranges from 18-28°c and mean temperature of 23°c. The mean annual rainfall of the area ranges from 600-850mm with mean of 725mm (ILRI, 2013).

**Human Population**

The total population of the wereda was 89,052. Of these population, 44,391(49.8%) and 44,661(50.2%) represented males and females respectively. this number was obtained from agricultural extension of the wereda. Tigrigna is the mother tongue for the population. The cultural food commonly used in the wereda is Injera with dero wet, shiro and keywet.

**Livestock Production**

Dairy, sheep, goats, poultry and honey bees productions are practiced in the wereda. Most of the production system is traditional and local poultry were dominant in the wereda (ILRI, 2013). Table 1 shows the types of livestock population in the study wereda.

Table 1: Livestock population

| | Number | | |
|---|---|---|---|
| Type | Local | Improved | Total |
| Cattle | 57,216 | 173 | 57,389 |
| Sheep | 46,573 | - | 46,573 |
| Goats | 85,326 | - | 85,326 |
| Poultry | 90,613 (81%) | 21602 (19%) | 112,215 |
| Honey bee colonies | 11,372 | 4,268 | 15,640 |

Source: ILRI, 2013.

## 2.2 Research Design

Descriptive type of research was adopted in this study. A cross sectional research design was employed because;

the study was conducted only in a time manner on small portion of sampled population.

### 2.3 Data type and source

Both qualitative and quantitative types of data were collected from the study area. In order to get the overall picture of poultry value chain in the study area, the study used both primary and secondary sources of data. The primary data on the poultry value chain functions were collected from poultry value chain actors through interview and focus group discussion.

### 2.4 Method of Sampling and Sample Size

With regard to sample size, it is believed that more sample households could have better representation of the target population. However, to make the research more manageable (both in time and resources) sample households were selected from the selected sample Tabias. The total numbers of Tabias found in the study area were 18 from which four Tabias were selected purposively based on information obtained from the wereda's bureau of Agriculture and Rural Development Office, accessibility to undertake the research, poultry potential and interest of LIVES project. Households that have chicken were the sampling frame for the study. Based on this, 6,066 households constituted the sampling frame. Totally, 200 respondents were selected according to the sample size determination table at alpha 0.05 (Bartlett *et al*., 2001). Then, respondents were taken using sample proportionate to size. The respondents were stratified in to female and male household heads. Finally, the households were listed with the assistance of DAs and then simple random sampling method was used to select respondents from each selected Tabias. 142 male and 58 female headed households were selected randomly from the listed sampling frame.

**Table 2: Number of poultry producer households and sample taken from each Tabia**

| Name of Tabias | Poultry producers* | | | Sampled HH | | |
|---|---|---|---|---|---|---|
| | Male | Female | Total | Males | Females | Total Sampled |
| Endamariam Shewito | 1161 | 503 | 1664 | 38 | 17 | 55 |
| Betyehanes | 936 | 268 | 1204 | 31 | 9 | 40 |
| Wediqeshi | 1025 | 446 | 1471 | 33 | 15 | 48 |
| Debregenet | 1204 | 523 | 1727 | 40 | 17 | 57 |
| Total | 4326 | 1740 | 6066 | 142 | 58 | 200 |

*Source: Office of agriculture and rural development and Tabias administrative data, 2015.

In addition to farm households, sample respondents were also selected from the other value chain actors on the basis of their size and availability and were interviewed based on their respective functions in the chain. Therefore, 10 collectors, 2 wholesalers, 17 retailers, 12 processers and 52 consumers were selected in the study area and Adwa town using random and purposive sampling techniques. All licensed (8) and 21 non licensed traders were selected using purposive and simple random sampling techniques respectively. Processors and consumers were also selected randomly.

### 2.5 Method of Data Collection

Enumerators working as development agents in each of the study Tabia were recruited and trained for data collection. The questionnaire was translated in to Tigrigna and backward to English languages. Then developed questionnaire was pre-tested to evaluate its design and time taken for the interview. Hence, appropriate modifications were made on the questionnaire. During data collection, the trained interviewers collected enough and accurate information or data from poultry producers in each selected Tabias to achieve the objectives of the study and avoid potential bias from the sampled households in responding to questions. The filled-in interview schedule was thoroughly checked for completeness and consistency. Similarly, informal surveys are employed to study the marketing systems of poultry and eggs to obtain additional supporting information for the study. Data was also collected from traders and processors through administering a structured and semi-structured questionnaire.

Key informant interview was utilized to get the relevant data that shows current poultry value chain in the study area. The key informants' interview was including: extension workers, input and output marketing experts, collectors, retailers, processors, end users, NGOs workers in the study area and poultry experts from BoARD

#### 2.5.1 Focus group discussion

A checklist was developed to guide the sequence of information to be collected from the focus group discussions. Members of the focus group discussion were selected from different groups such as elders, religion leader, Tabia administrator, Tabia's women affairs, model farmers and youth associations so as to collect accurate information or data about poultry value chain functions and the current constraints on value chain of poultry in the study area. Discussions were conducted in each selected Tabias with the size of 8 persons per selected Tabia. The focus group discussion was facilitated and monitored by the researcher and every member of the group was given equal chance to express his/her ideas. Information concerning poultry value chain functions, services, constraints and

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opportunities were collected from the focus group discussions using checklist.

### 2.6 Data Processing and Analysis
The data collected from respondents were analyzed by using SPSS 16 and STATA 10 software packages. Value chain mapping was utilized to address the core processes. In addition to that, it identified the value chain actors and their relationship, support services, types of value addition activities and trading in the study area. Descriptive statistics was also used to analyze the data.

## 3. Results and Discussion
### 3.1 Mapping and Analyzing Poultry Value Chain Functions in the study area
Value chain mapping is the graphic representation of input supply, production functions, processing, trading and consumption with in value chain actors. So, poultry value chain mapping was done to identify the core process, value chain actors and their activities at each stage. It was also performed to understand the characteristics of the chain actors and the relationships among them in the chain; the flow of goods through the chain; employment features; and the destination and volumes of domestic sales.

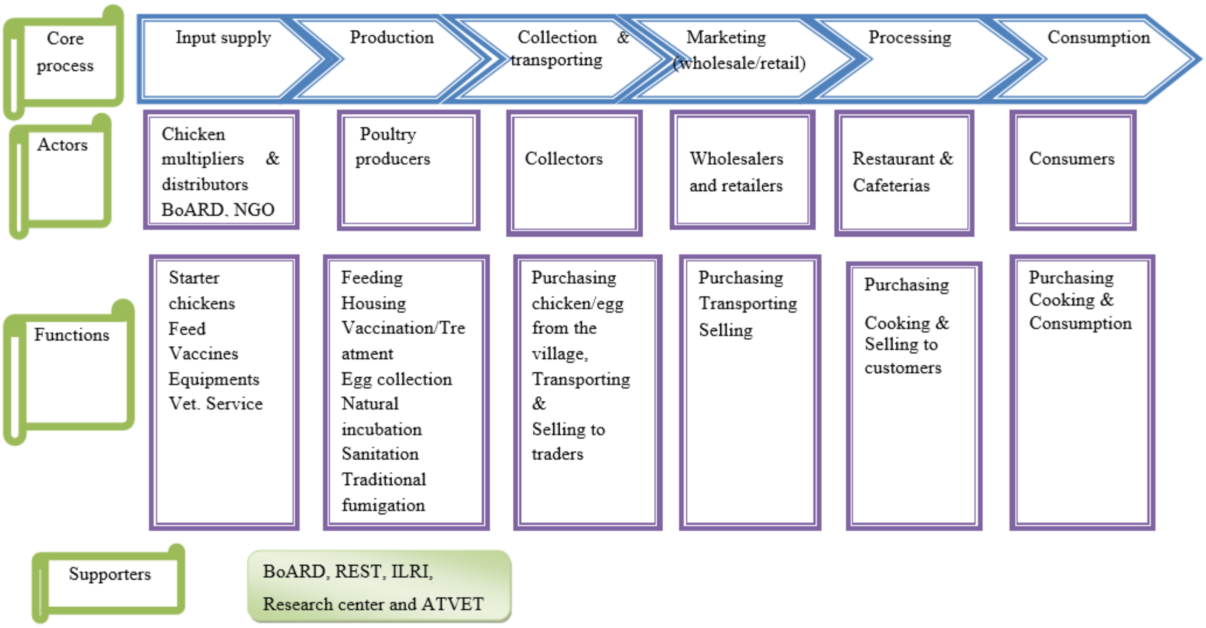


Figure 2: Poultry value chain map
Source: Own computation from the study.

#### 3.1.1 Input supply activities and involved actors
The sampled households replied that, the common feeds used for their poultry were cereal grains such as maize, sorghum, wheat and barley that are available in their home. They have also responded that office of agriculture and rural development gave them three months old exotic chicken. The main problem occurred in the poultry sector was lack of supervision and regular follow up of the chicken distributed to the farmers. As shown in table 3, about 55.5% and 52.8 % of the participants and non -participants replied that the source of local chicken was from their home respectively. About 36% and 45.8% of the participants and non participants bought the local chicken from the market respectively and about 7% of the participants received as gift from relatives. The source of exotic chicken for 54.7% participants and 15.3% non participants was agriculture office. Only 1.6% and 3.1% of the participants replied that, the source of exotic chicken was market and relatives, respectively. The source of hay box chick brooder for 6.25% of the participant was also agriculture office. About 86.7% of the participants and 33.3% of the non participant used poultry feed from their home while 5.5% and 1.4% of the participant and non participants bought from the market respectively. Market was the source of medication for 15.6% and 1.4% participant and non participant respectively. Agriculture office was the source of medication for 5.5% of the participants. (Table3).

Table 3: Farmers source of inputs

| Inputs & sources | Participant | Non participant | Total sample |
|---|---|---|---|
| | N=128 | 72 | 200 |
| | % | % | % |
| Local hen: | | | |
| Own | 55.5 | 52.8 | 54.5 |
| Market | 36 | 45.8 | 39.5 |
| Relatives | 7.0 | 0 | 4.5 |
| No | 1.5 | 1.4 | 1.5 |
| Exotic hen: | | | |
| Market | 1.6 | 0 | 1 |
| Agriculture | 54.7 | 15.3 | 40.5 |
| Relatives | 3.1 | 0 | 2 |
| No | 40. 6 | 84.7 | 56.5 |
| Hay box: | | | |
| Agriculture | 6.25 | 0 | 4 |
| No | 93.75 | 100 | 96 |
| Feed: | | | |
| Own | 86.7 | 33.3 | 67.5 |
| Market | 5.5 | 1.4 | 4 |
| No | 7.8 | 65.3 | 28.5 |
| Medication: | | | |
| Market | 15.6 | 1.4 | 10.5 |
| Agriculture office | 5.5 | 0 | 3.5 |
| No | 78.9 | 98.6 | 86 |
| Feed trough: | | | |
| Locally available | 6.25 | 2.8 | 5 |
| No | 93.75 | 97.2 | 95 |
| Water trough: | | | |
| Locally available | 100 | 100 | 100 |

Source: survey result, 2015.

### 3.1.2 Poultry production systems of the study area

Generally, there are 3 types of poultry production systems in Ethiopia such as intensive poultry production system, semi-intensive poultry production system and backyard poultry production system (as Yami and Dessie (1997), cited in USAID, 2010). There was no intensive poultry production system in the study area. As shown in table 4, about 94.5% and 98.6% of the participants and non participants managed their poultry under backyard production system respectively. About 5.5% and 1.4% of the participants and non participants also managed their poultry under semi-intensive production system respectively. Totally, about 96% and 4% of the producers managed their poultry under backyard and semi- intensive production system respectively. This result indicates that backyard poultry production system was the predominant production system in the study area.

Table 4: Farmer's poultry production system

| **Production system** | **Participant** | **Non participant** | **Total sample** |
|---|---|---|---|
| | **N=128** | **72** | **200** |
| | **%** | **%** | **%** |
| Back yard | 94.5 | 98.6 | 96 |
| Semi intensive | 5.5 | 1.4 | 4 |
| X2 | 74.7*** | | |

Source: Survey result, 2015.

### 3.1.3 Poultry breeds owned by producers

According to the survey study, about 56.5% of the sample farmers had local chicken and 43.5% of them had exotic chicken especially Rhode Island Red in their flock and some white leg horn. In case of the two groups, about 40.6% and 84.7% of the participants and non participants owned local chicken and about 59.4% and 15.3% of the participants and non participants owned exotic chicken respectively (Table5)..

Table 5: Proportion of producers owned poultry breeds

| Breeds | Participant | Non participant | Total sample | p-value | X2 |
|---|---|---|---|---|---|
| | **N=128** | **72** | **200** | | |
| | **%** | **%** | **%** | | |
| Local breed | 40.6 | 84.7 | 56.5 | 0.00*** | 34.45 |
| Exotic breed | 59.4 | 15.3 | 43.5 | | |

Source: Survey result, 2015. Significant Level: ***=1%

**3.1.4 Flock size and breed composition of poultry in the sample household**

Flock size and breed composition of poultry in rural and small scale farmers highly depend on the accessibility of input supply, housing system, disease incident and purpose of chicken keeping among producers. In the study area, the total flock size per household ranged from 2- 63 with average flock size per sampled household of about 9 which is the total number of local and exotic breeds. As indicated in Table 6, the average number of current flock size of poultry holding of the total sampled respondents for local and exotic breed was 5.69, and 3.37 respectively. The market participants and non-participants had an average of 6.19 and 4.79 local breeds per household respectively. In case of exotic chicken, the participants and non-participants had an average of 4.75 and 0.92 chicken respectively. As presented in Table 6, indicates there was statistically highly significant difference on the mean number of local and exotic poultry breed per household between participants and non-participants at ($p<0.05$) and at ($p<0.01$) respectively.

Table 6: Average current flock size per sampled household (currently available**)**

| | Participant (128) | | Non-participant (72) | | Total-sample (200) | | p-value |
|---|---|---|---|---|---|---|---|
| | Mean | Std | Mean | Std | Mean | Std | |
| Currently | | | | | | | |
| Local | 6.19 | 4.45 | 4.79 | 2.52 | 5.69 | 3.92 | 0.0153** |
| Exotic | 4.75 | 9.01 | 0.92 | 3.76 | 3.37 | 7.76 | 0.0007*** |
| Total | 10.94 | 8.97 | 5.71 | 3.58 | 9.06 | 7.89 | 0.0000*** |

Significant Level: ***=1% and **5% N=Sample size

Source: Survey result, 2015.

**3.1.5 Housing system of village chicken**

From the focus group discussion and personal observation, poultry were housed at night in the prepared house but allowed scavenging during the day time in backyard production system. The housing system was mostly not suitable for the poultry. Most of the poultry houses were made up of local materials such as stone, wooden and mud. It was constructed with very small size and short roof and was closed with flat stones at night. All groups of poultry were housed together and suffocation was the common problem in the study area. In addition to that, poultry were over-crowded and exposed to pests. Indigenous chicken were also perched on trees and circumference of the houses which have some woods placed for another purposes. According to respondents, poultry reared under this type of production system were more damaged by predators and bad weather condition than the other poultry production systems. Generally, backyard poultry production system resulted in high chick mortality caused by predators and disease. In regard to semi-intensive poultry production system, producers prepared a house made up of corrugated iron sheet and wooden material which was used during the night time. They have used straws on the floor of the house as a bedding material. Farmers prepared a fenced area in front of their permanent houses those were used during the day time for exercise and consume their feeds.

**3.1.6 Poultry feed and feeding system**

Producers in the study area gave small emphasis to poultry when compared with the other animals they owned. In backyard poultry production system, chickens were usually fed a handful of grain in the morning and evening to supplement scavenging. The chickens were moving far from the home to search their feed. Mostly, the farmers fed their chicken only once in the morning and almost all of the feeds were only cereal grains and some leftover feeds that are a source of energy. Even the amount of grain given to the chicken was very small and all groups were given the feed together on the ground. This study revealed that poultry in the rural areas were consuming low quantity and quality of feed. Generally, both the feed and feeding practice were poor and these activities resulted in low poultry productivity. The watering practice for the chicken was also poor and the water and water troughs used were dirty. As shown in table 7, about 92.2% and 34.7% of the poultry market participants and non participants provided supplementary feed to their chicken respectively. But, about 7.8% and 65.3% of the poultry market participants and non participants did not provide supplementary feed to their poultry. Therefore, among the poultry market participants and non participants, there was a significant difference in providing supplementary feed for their chickens at ($p<0.01$). Of the total sampled households, 71.5% of the sampled households provided grains as supplementary feed and 28.5% of them did not provide grains to their chicken. This result indicated that, farmer involved in feed supplementation to the poultry can produce and participate more in the market than those of farmers who did not provide supplementary feed to the poultry.

Table 7: Farmers feed supplement to their poultry

| Feed supplement | **Participant** | **Non participant** | **Total sample** | P -value | X2 |
|---|---|---|---|---|---|
| | **N=128** | **72** | **200** | | |
| | **%** | **%** | **%** | | |
| Supplement | 92.2 | 34.7 | 71.5 | 0.00*** | 74.67 |
| Not supplement | 7.8 | 65.3 | 28.5 | | |

Significant Level: ***=1%
Source: Survey result, 2015.

**3.1.7 Disease prevention mechanisms**

Discussions with the development agents and agricultural bureau experts revealed that Newcastle disease is the most frequently observed diseases in the study areas. Farmers did not consider that chickens could be infected by disease causing agents found in any dirty and spoiled feeds. Among 200 chicken producers, 86% of the farmers had lack of knowledge on modern drugs availability and inadequate resources to seek for veterinary advisory. The remain14% of the sample households used modern treatment. This indicated that, most of the households in the study area use traditional treatment for infected chicken (Table 8). About 79% and 98.6% of the participants and non participants used traditional treatment respectively. In case of modern treatment, about 21% and 1.4% of the participants and non participants used modern treatment respectively. Moreover, as discussed with the focus group and individual interview, traditional medications such as neem, '*Feto,' 'Areke,' lemon juice, coffee* and *bitter* were given for the chicken in the time of disease outbreak without consultation with veterinary professionals due to lack of getting veterinary service. Existence of traditional knowledge on poultry diseases management are the possible bottlenecks in the sub-sector regarding disease management. The respondents who prepared poultry house replied that they do not have separate day and night time house and chicken spent the whole day elsewhere searching for feed making diseases transmission substantial and severe.

Table 8: Method of disease treatment used by the households

| Treatment type | **Participant** | **Non participant** | **Total sample** | P-value | X2 |
|---|---|---|---|---|---|
| | **N=128** | **72** | **200** | | |
| | **%** | **%** | **%** | | |
| Traditional | 79 | 98.6 | 86 | 0.00*** | 14.86 |
| Modern | 21 | 1.4 | 14 | | |

Source: Survey result, 2015.

Most poultry producers in the study area focused on traditional treatments and there was no vaccination and de-worming practices for their chicken even among the farmers who used modern treatments. Except for the little effort made to distribute some exotic breeds as part of the extension package under went in the study area, there were no extension support attached to management, vaccination, treatment and marketing extension services. More exotic chickens died immediately after being distributed to the farmers due to lack of good management and treatment.

**3.1.8 Number of poultry layers holding in the sampled producers**

As indicated in Table 9, the average layer size per sampled respondents for local and exotic breeds were 1.49, and 1.85 respectively. Comparing the groups, poultry market participants and non-participants had an average of 1.69 and 1.13 local layers respectively. In case of exotic layers, the participants and non-participants had an average of 2.76 and 0.22 respectively As presented in Table 9, the t-test indicates that there was statistically highly significant difference between the mean number of local and exotic layers per household between participants and non-participants at ($p<0.01$).

Table 9: Average layers size per sampled household.

| | Participant (N=128) | | Non-participant (N=72) | | Total-sample (N=200) | | P-value |
|---|---|---|---|---|---|---|---|
| | Mean | Std | Mean | Std | Mean | Std | |
| Layers | | | | | | | |
| Local | 1.69 | 1.01 | 1.13 | 0.50 | 1.49 | 0.90 | 0.000*** |
| Exotic | 2.76 | 6.94 | 0.22 | 0.63 | 1.85 | 5.69 | 0.002*** |
| Total | 4.45 | 6.99 | 1.35 | 0.72 | 3.33 | 5.80 | 0.000*** |

Significant Level: ***=1% N=Sample size
Source: Survey result, 2015.

**3.2 Productivity and Profitability of Village Poultry keeping**

**3.2.1 Productivity**

According to the survey result, chickens that received a supplementary feed and good housing were more productive than the chickens that were receiving their feed by scavenging and lack proper housing system. According to the respondents, the age at first egg was 7.5 months for indigenous chicken and 6 month for exotic chickens. The findings showed that the local birds in the study area reached sexual maturity lately than that of exotic chicken. Gebregziabher (2007) reported that the overall average age at first egg was 7.07 months and ranged from 5-10 months. As shown in table 17, the average production by sampled households was about 24.93 chickens per year and the market participant and non participant households have produced averagely 31.75 and 12.8 chickens, respectively, per year. This indicated that there is highly significant difference on the mean number of chicken produced of local layers and exotic layers per household obtained annually between participants and non-participants at (p<0.01). Therefore, this level of production is limited and not as such satisfactory due to different constraints.

Table 10: Number of poultry available and produced per household in 2013/14

| | Participant (N=128) | | Non-participant (N=72) | | Total-sample (N=200) | | P-value |
|---|---|---|---|---|---|---|---|
| | Mean | Std | Mean | Std | Mean | Std | |
| **Currently** | | | | | | | |
| Local | 6.19 | 4.45 | 4.79 | 2.52 | 5.69 | 3.92 | 0.015** |
| Exotic | 4.75 | 9.01 | 0.917 | 3.76 | 3.37 | 7.76 | 0.000*** |
| Total | 10.92 | 8.97 | 5.71 | 3.58 | 9.05 | 7.89 | 0.000*** |
| **Produced** | | | | | | | |
| Local | 17.64 | 11.90 | 11.14 | 4.85 | 15.3 | 10.42 | 0.000*** |
| Exotic | 14.11 | 20.13 | 1.67 | 5.59 | 9.63 | 17.48 | 0.000*** |
| Total | 31.75 | 19.06 | 12.81 | 4.92 | 24.93 | 17.98 | 0.000*** |

Significant Level: ***=1%, and **=5% N=Sample size

Source: survey result, 2015.

**3.2.2 Level of egg production**

As clearly indicated in table 11, egg production was markedly different for the indigenous and exotic chickens between participants and non-participants. The total egg produced per sampled household during the study year was about 86 and 260 eggs for the local and exotic layers, respectively. The total egg produced by participant and non participant household during the study year was about 98 and 63 eggs for the local layers, respectively. About 383 and 42 eggs were produced by participant and non participant from exotic layer, respectively. As indicated in table 11, there is highly significant difference between the mean egg produced by local layers and exotic layers per year and between participants and non-participants at (p<0.01). High variability in egg production was also observed between poultry market participant and non-participant sample farmers. This is most probably due to differences in management of poultry, and market concern.

Table 11: Amount of egg produced per sampled household in 2013/14

| | Participant (N=128) | | Non-participant (N=72) | | Total-sample (N=200) | | P-value |
|---|---|---|---|---|---|---|---|
| | Mean | Std | Mean | Std | Mean | Std | |
| **No. of Layers** | | | | | | | |
| Local | 1.7 | 1.0 | 1.1 | 0.5 | 1.5 | 0.9 | 0.0000*** |
| Exotic | 2.8 | 6.9 | 0.2 | 0.6 | 1.9 | 5.7 | 0.0023*** |
| Total | 4.5 | 7.0 | 1.4 | 0.7 | 3.3 | 5.8 | 0.0002*** |
| **Egg produced by:** | | | | | | | |
| Local breed | 98.2 | 62.4 | 63.0 | 31.3 | 85.5 | 55.9 | 0.0000*** |
| Exotic breed | 382.6 | 643.5 | 42.1 | 125.3 | 260.0 | 544.7 | 0.0000*** |
| Total | 480.8 | 649.4 | 105.0 | 120.9 | 345.5 | 554.2 | 0.0000*** |

Significant Level: ***=1%, N=Sample size

Source: Own survey result, 2015.

As indicated in table 12, the average annual egg production level per hen for both local and exotic layers were 57 and 189 respectively. This indicated that, the level of egg production in the study area generally was very poor and the households reflected that the low level of egg productivity was due to diseases, lack of good housing, poor feed and feeding activities and poor poultry breed type especially the local /indigenous chicken. In case of participants and non participants, the average annual egg productions per local layer were 58 and 55 respectively. About 189 and 187 eggs were the average annual egg production level of exotic layer in participants and non participants respectively. As indicated in table 12, there is a significant difference in egg productivity of local layer among participants and non participants at less than 10% significance level. Generally, there was no a great difference in annual egg production level.

Table 12: Average Annual egg production per hen per year by sampled households

| Poultry breed type | Participant (N=128) | | Non-participant (N=72) | | Total-sample (N=200) | | P-value | t-value |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std | Mean | Std | Mean | Std | | |
| Local | 58 | 11.2 | 55 | 6.3 | 57 | 9.7 | 0.06* | -1.87 |
| Exotic | 189 | 48.98 | 187 | 38.3 | 189 | 47.8 | 0.9 | 0.096 |
| Total | 123.85 | 30.1 | 121.7 | 22.3 | 123.25 | 28.75 | | |

Significant Level: *=10%
Source: Survey result, 2015.

**3.3 Number of marketing actors and their relationship:** According to the traders, there were about 8 licensed and 32 non licensed poultry traders in the study area. The numbers of marketing actors included in the study were about 29 poultry traders, 12 processors and 52 consumers.

**3.3.1 Relationship among poultry value chain actors**

The relationship among poultry value chain actors in the study area was very weak. Most of the actors think only to increase their wealth rather than thinking for mutual benefit. According to the focus group discussion, the main reason for the weak relationship among actors was due to lack of awareness, organization and infrastructure. Egg wholesaler in the study area were somewhat linked with cafeterias and restaurants on the amount and type of eggs needed and the price. According to the cafeterias and restaurant owners, they communicate and agree on price and volume needed using telephone. But, this relationship is informally practicing in the study area. Relationship among the other poultry marketing actors was absent and this indicated that poultry value chain in the study area was weak and more traditional. As shown in figure 7, there was spot market relationship among marketing actors except there were partial relationship between wholesalers and cafeterias and restaurants. There was no persistent market relationship among market actors in the study area.

**Relationship between actors**

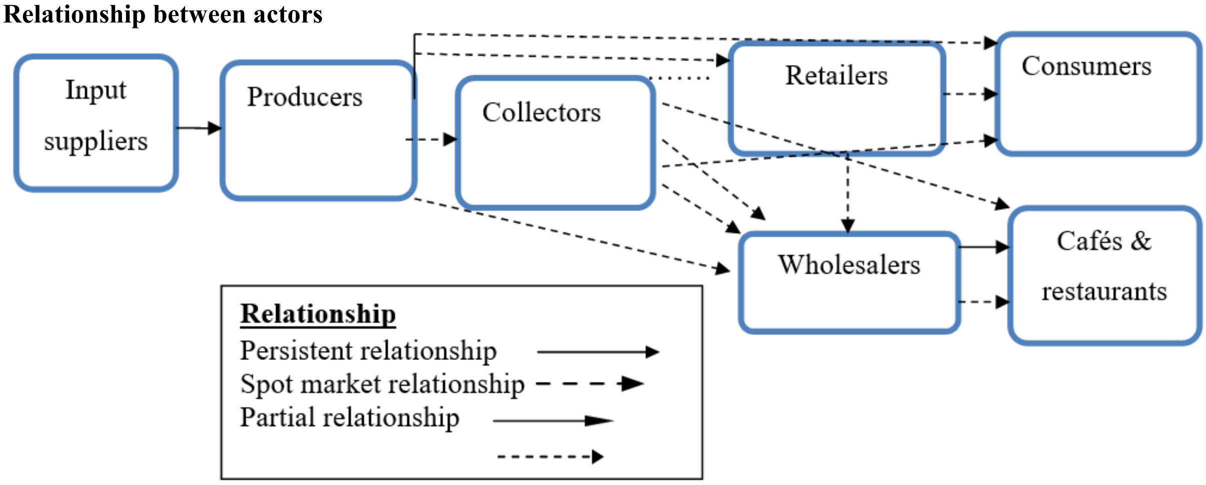


Figure 3: Relationship between actors
Source: Survey result, 2015.

**Spot market relationships:** are relations that are created on the spot that means that actors make a transaction (including negotiation on price and volume agreements) with the duration and scope of that specific transaction. Buyers and sellers meet, come to agreement (or not) and breaking the relationship.

**Persistent market relationship**: when actors have preference for transacting with each other time and time again, we can speak of a persistent net work relation. This comes with a higher level of trust and some level of interdependence and can be formalized by contracts.

**Partial relationship**: It includes a mixed type (spot and persistent) of market relationships.

**3.3.2 Value addition**

Value addition includes any services and activities implemented to produce, transport and process a product. There were different value chain actors who added a value on poultry and its products. Poultry producers in the study area played a great role in adding value on their chickens. The main value addition implemented by the farmers was managing, delivering /transporting poultry and eggs from their home and poultry farms to the market place. The other value adding actors were collectors, retailers, whole sellers and processors. Collectors added a value on poultry by collecting and transporting chickens and eggs from rural areas to the market place. In addition to that wholesalers and retailers also added some value on poultry such as transporting, storing and managing activities especially whole sellers added more. Cafeterias and restaurants also added value by processing eggs for their consumption and selling to the customer. According to the survey study, marketing actors added a selling price for their value addition activities but, most of the farmers did not consider for the value addition they incurred especially for their labor and transport expenses. As shown in Table 13, a total value added along the poultry value chain was Birr 70.8 per chicken. Producers in the study area added 57.4% of the total value added in poultry, which was higher than the value added by collectors and retailers, 28.8% and 13.8% value, respectively.

Table 13: Distribution of value addition in poultry

| Value chain actors | | | |
|---|---|---|---|
| Average Price | | | |
| Average Cost | 54.7 | 89.10 | 109.7 |
| Value added | 40.6 | 20.4 | 9.8 |
| % of value added | 57.4 | 28.8 | 13.8 |

Total value added=70.8 Birr

Source: Survey result, 2015.

As shown in Table 14, a total of value added along the egg value chain was Birr 0.84 per egg. Producers in the study area added 39.3% of the total value added in egg, which was higher than the value added by collectors, wholesalers and retailers.

Table 14: Distribution of value addition in egg

| Value chain actors | | | | |
|---|---|---|---|---|
| Average Price | | | | |
| Average Cost | 1.70 | 2.15 | 2.2 | 2.40 |
| Value added | 0.33 | 0.15 | 0.24 | 0.12 |
| % of value added | 39.30 | 17.85 | 28.55 | 14.30 |

Total value added= 0.84 Birr

Source: Survey result, 2015.

## Conclusion

The study was aimed at value chain analysis of poultry in Adwa Wereda, Central Zone of Tigray. The specific objectives of the study include mapping poultry value chain functions along in the study area.

The whole poultry value chain map in the study area shows very weak and is more traditional. The linkage among producers, traders and consumers is weak because, there is no strong forward and back ward flow of information for mutual benefit. The core process, main actors and functions were identified in the poultry value chain map. In the poultry value chain map, 6 core processes (input supply, production, collection and transporting, marketing, processing and consumption) were identified. Poultry value chain supporters such as BoARD, REST, ILRI, ATVET and research center contribute their role in improving poultry value chain functions.

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