

Poultry Production System and Role of Poultry Production in Tigray Region, Northern Ethiopia: A Review

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ABSTRACT

Related research results and facts of indigenous chicken production in and out of Tigray region were reviewed with the aim of delivering information to the improved production and for the breeding plan of a region. The study revealed that there are various advantages which make poultry attractive in the context of poverty alleviation and quality protein supply in Tigray region. The study also showed that there are three major production systems such as village or backyard poultry production system, small scale poultry production system and commercial poultry production system. The common production system used was mostly extensive type that is characterized by small flock sizes; it needs no or less inputs and a periodic devastation of the flock by diseases.

As a conclusion, government and non government organization should enhance the private sector to engage in poultry feed production, supplying watering, feeding and hatching materials. Government should be developing the community based disease diagnosis and proactive protection and control options .Government should be strengthen the local private/public drugs/vaccine supplier and services providers.

Keywords: Flock composition, Chicken distribution, Breed

1. Introduction

The Tigray region, in northern Ethiopia, is a predominantly agricultural economy where agriculture contributes more than 50 percent to GDP and 85 percent to employment (TBoANRD, 2003). Livestock production, as one component of agriculture, covers 40 percent of agricultural output and it also plays an important role in the national economy as it contributes 13-16 percent of the total GDP (Abassa, 1995; Seifu, 2000). Poultry production, as one segment of livestock production, has a peculiar privilege to contribute to the sector. This is mainly due to their small size and fast reproduction compared to most other livestock and its well fitness with the concept of small-scale agricultural development. Moreover, it goes eco friendly and does not compete for scarce land resources.

According to the central authority 2011 report the local chickens of Tigray Regional State are estimated to be over 4,999,678, which are about 11.65% of the total national indigenous chicken population, contributing about 15% of the total annual national egg and poultry meat production. The regional rural areas constitute about 80.9% of the total regional chicken population while the urban areas constitute 19.1%. West and Central Tigray Zones together account for about 70% of the total regional poultry population (Solomon, 2008). Ninety-nine per cent of the population consists of local breed types under individual farm household management (Alamargot, 1987), and the remaining 1% of birds are mainly in state-run modern production systems, with a very small proportion in private units.

Improving the productivity of village chicken through breeding and improved managements will result in increasing opportunities of equitable distribution of food and income for the households of rural areas of Ethiopia. Therefore, reviewing the research results and the best practices of local chicken productions in a region will enable the delivering of good information that will also be helpful for the future planning of the strategic breeding programs, and generally for improved indigenous chicken production projects of a region. Based on this outlined background, the Objective of this paper was to review the research findings of the Poultry production system and role of poultry production in Tigray region, and thereby to deliver information for breeding and improved village chicken production programs.

2. METHODOLOGY

Most of the research findings that have relation with indigenous chickens in Tigray region and some related

issues from the countries were reviewed. Reports of research findings that focused on Poultry production system and role of poultry production were reviewed at times of the original data collections. Findings of poultry breeds and their distribution rates were also reviewed, depicted and sourced.

3. Overview on poultry production and distributions in Tigray region

Poultry include all domestic birds kept for the purpose of human food production (meat and eggs) such as chickens, turkeys, ducks, geese, ostrich, guinea fowl and doves and pigeons.

In Ethiopia ostrich, ducks, guinea fowls, doves and pigeons are found in their natural habitat (wild) whereas, geese and turkey are exceptionally not common in the country. Thus the word poultry is synonymous with chicken production under the present Ethiopian conditions (EARO, 1999). Indigenous poultry contribute almost 99% of the national egg and poultry meat production (Tadelle *et al.*, 2003).

There is no recorded evidence indicating the exact time and locations of introduction of the first batch of exotic breeds of chickens into Ethiopia. It is widely believed that the importation of the first batch of exotic poultry was probably done by missionaries. Four breeds of exotic chicken (Rhode Island Red, Australop, New Hampshire and White Leghorns) were imported to Jimma and Alemaya in 1953 and 1956, respectively under USAID project (Solomon, 2007). On top of these, the Ministry of Agriculture established several exotic chicken breeding and multiplication centers at different parts of the country to enhance the national poultry extension activities.

Tigray regional state has considerable livestock resources (Table. 1) tigray accounts for 6.4% of cattle, 11% of goats and 12% of poultry in Ethiopia (CSA, 2012).about 8.4% of the country's livestock found in this region. the livestock distribution of the region by type based on the central statistics authority report for the year 2010 to 2011 in Tigray region out of the total regional livestock, poultry is the largest resources which accounts for 33.5%, followed by cattle, goat, sheep and donkey, representing 28.2%, 23.7%, 9.7% and 4.4% respectively (Figure.1). In this report, poultry includes cocks, cockerels, pullets, laying hens, non-laying hens and chicks. Consequently, as shown in Table 2 and Most of the poultry are chicks (1,903,905), followed by laying hens (1,411,830). Pullets are estimated to be 512,940 in the region. Cocks and cockerels are also estimated separately, 372,110 and 368,829, respectively. The others are non-laying hens that make up 8.6 percent of the total poultry population in the region. Rural areas constitute about 81.0 percent of the total poultry, which is significant, while urban areas comprised of 19.0 percent (figure 2).

Pertaining to zonal distribution, 35.41 percent, 34.58 percent, 17.07 percent, and 11.49 percent of the total poultry population are found in West, Central, South, and East Tigray Zones, respectively. The remaining 1.45 percent of the total poultry population is reported by Mekele Zone (Table 2).

3.1. Poultry production system of Tigray region

The poultry sector in Ethiopia especially in Tigray can be characterized into three major production systems based on some selected parameters such as breed, flock size, housing, feed, health, technology, and bio-security (Alemu & Tadelle, 1997). These are village or backyard poultry production system, small scale poultry production system and commercial poultry production system.

3.1.1 Village or backyard poultry production system

This system is characterized by a low input (scavenging is almost the only source of diet), low input of veterinary services, minimal level of bio - security, high off - take rates and high levels of mortality. Here, there are little or no inputs for housing, feeding or health care. As such it does not involve investments beyond the cost of the foundation stock, a few handfuls of local grains, and possibly simple night shades, mostly night time housing in the family dwellings. The poultry are kept in close proximity to the human population. Mostly indigenous chickens are kept although some hybrid and exotic breeds may be kept under this system (Nzietchung , 2008). The few exotic breeds kept under this system are a result of the government extension programs. The size and composition of flocks kept by households vary from year to year owing to various reasons such as mortality from diseases, agricultural activities and household income needs. Mortality in local birds results mainly from disease and predators as well.

Poultry population and the average number of chickens per household (flock size) are estimated at 7.2 in Tigray regional state, the values of which are above that of the national average of 4.1 (Solomon, 2008). Most of the birds kept under the backyard system belong to indigenous poultry. The backyard poultry production systems are not business oriented rather destined for satisfying the various needs of farm households. In this case, the major

purposes of poultry production include eggs for hatching (51.8%), sale (22.6%), and home consumption (20.2%) while chickens for sale (26.6%) and home consumption (19.5%).

Backyard poultry move freely between families in the village. Movement can also be from household to local market for sale, from market to household in case of unsold chicken or in form of gifts from household to household.

3.1.2. Small - scale commercial poultry production (semi intensive production system)

In this system, modest flock sizes usually ranging from 50 to 500 exotic breeds are kept for operating on a more commercial basis. Most small - scale poultry farms are located around zonal towns. This production system is characterized by medium level of feed, water and veterinary service inputs and minimal to low bio - security. Most small - scale poultry farms obtain their feed and foundation stock from large - scale commercial farms (Mekelle, kombelcha, Genesis, Alema etc)

Nzietchung (2008) points out that there are few studies about diseases affecting poultry in this production system. Kinung'hi *et al.* (2004) mention coccidiosis as a cause of mortality, reduced weight gain and egg production, and reduced market value of affected birds. In small -scale poultry production poultry were vaccinated against coccidiosis, NCD and Gumboro disease, the vaccination are done by technician and the owner.

There are also emerging small scales intensive systems in urban and peri-urban areas, Under this system of production, a small number of exotic breeds of chickens (100-500) are produced along commercial lines using relatively modern management methods. This activity is being undertaken as a source of income in and around major cities and towns such of the region. Most of these smallholder farmers obtain their feeds and foundation stocks from Mekelle poultry farm and other commercial poultry farms of the country especially from Amhara region (kombelcha) and Debreziet.

3.1.3. Large - scale commercial poultry production (intensive production system)

It is a highly intensive production system that involves, on average, greater or equal to 10,000 birds kept under indoor conditions with a medium to high bio - security level. This system heavily depends on imported exotic breeds that require intensive inputs such as feed, housing, health, and modern management system. This system is characterized by higher level of productivity where poultry production is entirely market - oriented to meet the large poultry demand in major cities. The existence of somehow better bio - security practices has reduced chick mortality rates to merely 5% (Bush, 2006).

In Tigray, the commercial poultry sector is situated only around Mekele town which is called Mekele farm. Mekele farm is major large - scale poultry enterprises in the region that are located in the capital city of the region. Mekele farm supplies about 900,000 fertile eggs, 180,000 day old chickens and 100,000 pullets and cocks per annum to the smallholder grower and farmer of the region (Goutard and Magalhaes, 2006) but at this time the capacity of the farm is increasing. It has its own parent layer stock farm; feed processing plant and hatchery. In the intensive poultry production system, there are also many public poultry growing and distribution centers (PGDC) that are located in different zones of the region operating with the major objective of distributing improved exotic breeds of layer and dual purpose breeds to smallholder farmers in the region.

3.2. Importance of poultry in household economy: income, nutrition and food security

There are various advantages which make poultry attractive in the context of poverty alleviation and quality protein supply in Tigray region. Poultry in one form or another is kept in most areas, there are no any religious or social taboos associated with it, it has a high reproduction rate per unit time, it is efficient in transforming feed protein and energy into human food, it uses a very low capital investment and space needed for small-scale poultry production which allows poultry production to be practiced even by landless families or other rural poor and eggs and meat represent consumable units which do not require storage and preservation facilities. Traditional chicken rearing fits quite well to the conditions of rural households by creating employments and generating family income. The small feed cost and space requirement and the low price of the animals make chicken rearing a suitable farming activity for the rural poor. According to Gueye (2007) rural households in these areas value most highly the possibility of cash income from poultry keeping and believe that village poultry act as a "starter" that enables people to raise themselves and their families from degrading poverty to a stronger livelihood. According to Aklilu (2007), village poultry is the first step on the ladder for poor households to climb out of poverty. It is also the only capital that households have left when livelihoods are threatened by various reasons such as drought. An important function of poultry is their bartering value.

Poultry is a source of self-reliance for women, since poultry and egg sales are decided by women (Aklilu et al., 2007) and provide women with an immediate income to meet household expenses such as food. Moreover, poultry are used for strengthening marriage partnerships and social relationships. In the local culture, particularly in rural areas of Tigray regions, women who can provide men with food like a chicken dish (Doro wot) are considered to be contributing to a stable marriage. Serving Doro Wot is also a demonstration of respect to guests, thus strengthening a social relationship which is especially important for poor households. For the poor, poultry meat is the only special meal they can afford during religious festivities like New Year, Christmas and Easter. Church leaders and attendants are also served with chicken dishes. In general, socio-cultural roles are more important in areas with the poorest market access particularly in the Tigray regional state (Aklilu, 2007).

Chickens however are an important source of food for women post - birth; chickens are payment to villagers for local health services; chickens are gifts to newly married couples; and chickens strengthen social networks between women (Bush, 2006). In addition to these, the spiritual benefit of sacrifice of indigenous chicken types has also an important place in the cultural, social and religious functions of the Ethiopian society (Tadelle and Ogle 2001).

Annual poultry meat and egg consumption per household is estimated at 2.19 Kg and 1.72 kg respectively in the Tigray regional state as compared to the national average of 0.12 and 0, 14 kg respectively. Similarly, the annual live bird and egg sale per household is estimated at 6 chicken and 100 eggs respectively in the Tigray Regional State (DPPA, 2005).

4. Conclusion and Recommendation

Poultry production, as one segment of livestock production, has a typical benefit to contribute to the sector. Tigray regional state has large livestock resources. There are various advantages which make poultry attractive in the context of poverty alleviation and quality protein supply in Tigray region. The poultry sector in Ethiopia especially in Tigray can be characterized into three major production systems such as village or backyard poultry production system, small scale poultry production system and commercial poultry production system. Therefore, government and non government organization should enhance the private sector to engage in poultry feed production, supplying watering, feeding and hatching materials. In Tigray region there is a public sector monopoly of chick supply system, severe feed supply shortage and poor veterinary services, therefore higher institutions, research centers and other stockholders should play their role to develop knowledge and capacity of producers especially jobless university graduate students to mix poultry feed (broiler and layer ration) and to establish hatchery unit. Government should be developing the community based disease diagnosis and proactive protection and control options. Government should be strengthen the local private/public drugs/vaccine supplier and services providers.

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Table 1:- Number of livestock by type of animal, in Tigray from2010-2011

year	cattle	sheep	goat	horse	donkey	Mules	camel	Poultry
2010	3242331	1149717	2621227	-	450033	4320	32200	4260077
2011	3630957	1255403	3049486	2108	568121	4229	34205	4308595

Figure 1.livestock distribution of the region by type.

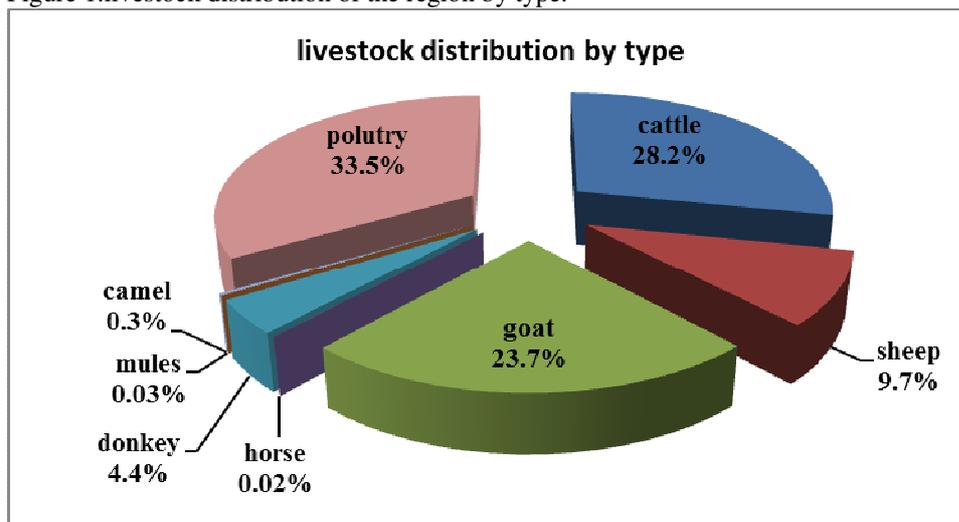
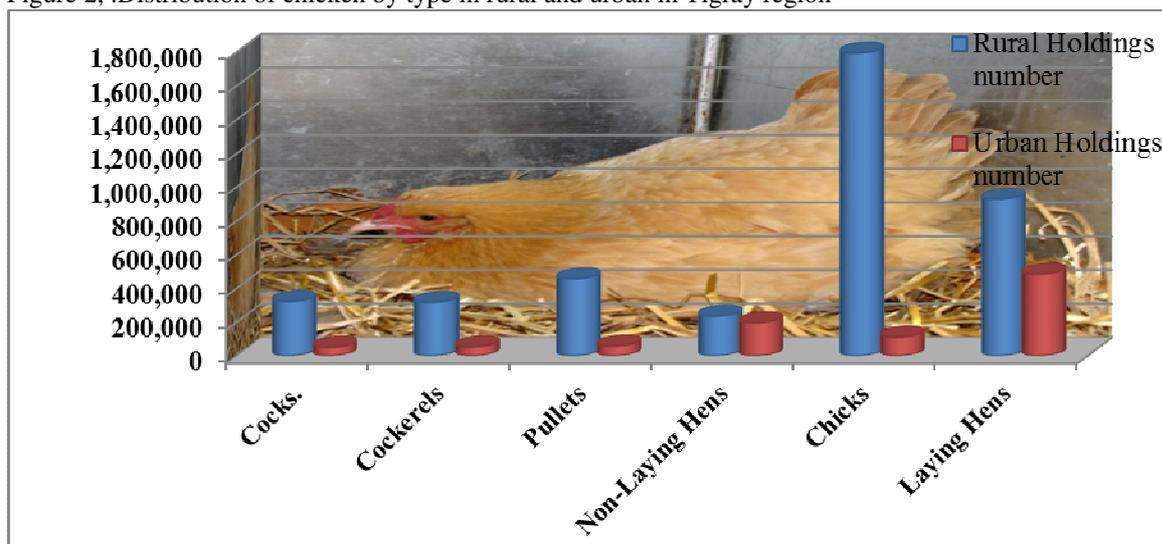


Figure 2. Distribution of chicken by type in rural and urban in Tigray region



Source: (CSA, 2012)

Table 2. Flock composition of poultry in Tigray by zone and national in 2010/11

Geographical Area	Total poultry	Cocks	Cockerels	Pullets	Non-laying hens	Chicks	Laying hens
Ethiopia	49,286,932	5,614,700	2,771,221	4,878,184	1,834,686	18,294,799	15,893,347
Tigray	4,308,595	434,837	295,208	465,162	234,683	1,666,593	1,212,112
North west Tigray	994,147	85,649	85,611	109,388	38,218	458,647	216,633
Central Tigray	1,117,881	121,365	72,790	126,659	47,134	409,502	340,430
Eastern Tigray	690,006	82,832	34,410	75,415	45,930	184,327	267,092
Southern Tigray	845,548	93,310	39,661	85,737	63,639	313,482	249,719

Source (CSA, 2010/11)

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