

Assessment Potential and Constraints of Poultry Production in Marako Woreda, Gurage Zone, Southern Ethiopia

Abera Anja^{1*} Hussen Temkatu²

1. College of Agriculture, Wolaita Sodo University

2. Marako Woreda Agricultural office, Gurage Zone, Southern Ethiopia

Abstract

The study was conducted to assess the production and constraints of poultry production in Marako Woreda, Gurage Zone, Southern Ethiopia. The data were collected using questionnaire survey using 100 households. The information obtained from the questionnaire survey revealed that the production system is often characterized by low input-low output productivity characterized as free ranging system (70%). The mean flock size recorded in this study was 4.82 chickens, the value of which is higher than the national average, 4.1. About 80% of the respondents used to supplement poultry with cereal grain like wheat and corn during early in the morning and late in the afternoon. The flock composition consists of laying hens (27%) which reflect their retention for production purposes. The majority about 60% of the farmers keep poultry for sale which is to enhance the income of the farmers. Seventy percent of the respondents' access support of extension services. Seventy percent of the respondents argued that the average number egg-laying period per hen per year is about 4 where as 50% of the respondents responded that average number of eggs laid per hen per egg-laying period is 12. The major constraints of poultry production in the study area are capital, disease, market, predator and feed shortage in the order of rank. Moreover, the outbreak of Newcastle disease is the major problem affects poultry production and usually happens at the beginning of rainy season. Therefore, to improve production and attain increased productivity, there has to be a means to have credit access for the farmers which strengthens farmers' economic situations. In addition to this it is better to create awareness of farmers to about the management of poultry to enhance productivity.

Keywords: Free ranging system, flock size, egg-laying period, Newcastle disease

1. INTRODUCTION

Poultry production has great role in the economies of a country. It has also cultural social benefits that have higher contribution in the nutrition of family in developing countries, like Ethiopia. Poultry meat and egg production accounted for more than 28% of the total animal protein produced worldwide in 1997 (Tadelle *et al.*, 2003). Nevertheless, the industry is not well developed in poor countries, such as Ethiopia and a typical person in developing world consumes on average only a third as much meat as those in developed world. Poultry has fast generation interval and high reproductive rate compared to most other livestock. It is prolific, easy to rear and their output can be generally expanded more rapidly and easily than that of other livestock (Reta, 2009). However, Poultry production in tropical countries is based on the traditional scavenging system and chicken are the most important poultry species. The largest proportion of age and poultry meat in Ethiopia is produced by village system (Tadelle, *et al.*, 2003). The indigenous have many conserved traits and advantage to three scavenging system.

Rising income and urbanization in many parts of the developing world caused a growing demand for animal products (Tadelle *et al.*, 2003). There are only few alternative animal protein sources available. However, there are many constraints that inhibit the productivity of poultry in Ethiopia. For instance, it has been reported the main problems of indigenous chicken in the tropic is that they are poor producers of egg and meat (Alemu, 1995). But even if they show low productive, they are well adapted to the tropic environment which is characterized by feed shortage and some common disease and parasite.

Furthermore, the indigenous chicken are better adapted to production circumstances of scavenging systems characterized by continuous exposure to disease incidence, inadequate quantity and quality feeding, poor housing and health care (Guèye, 2005). To achieve increased productivity, extension service has continuously disseminated management interventions to smallholders for mitigating these challenges. However, majority of smallholder farmers with smaller flock size hardly realizes improved productivity, which could be explained by the manner in which they selectively adopt or refuse to adopt disseminated management interventions package, production practices and challenges.

Although, Marko Woreda which is found in Gurage zone, southern Ethiopia has a great potential in poultry production, there is no well documented and no research conducted so far in the area in determining the poultry production practices by assessing its potential and constraints. Therefore this research aimed to assess the existing potential and constraints of poultry production in the study area.

Objective

To assess the poultry production system in *Marko* Woreda
To identify constraints associated with poultry production system in the study area

2. MATERIALS AND METHODS

2.1. Area Description

The study was conducted in *Marko* Woreda *Gurage* Zone, Southern Ethiopia. It is located 110km from south of Addis Ababa and 10km from south east of *Butajera*. The Woreda is generally characterized by the slope with altitude ranging from 1350-1800masl. The agro ecological zone of the study area is comprised of mid altitude (*Woina-Dega*), low altitude (*Kola*) and high altitude (*Dega*). The annual rainfall distribution of the area is 801-1200 ml. The temperature during day time is 17.6-20c°. This area has loom soil type and its agricultural system is mixed farming system or livestock production and crop production. The major crops grown in *Marako* Woreda are maize, teff, barley, wheat and sorghum. The major livestock widely reared in the study area are cattle, donkey, horse, mule, sheep and goat (MWAB, 2008).

2.2. Sampling method

Multi stage sampling was employed to select households for the present study. The *Marko* Woreda totally has 23 kebeles from these 5, 9 and 9 kebels are *dega* (highland), *Kola* (lowland) and *WoinaDega* (mid altitude), respectively. For the present study to make representative based on agro ecology, one kebeles from *Dega* and 2 kebeles each from *WoinaDega* and *Kola* were taken. Generally 5 kebeles were used for the study. In each Kebeles 20 households purposively selected based on poultry production potential. Thus, totally 100 households would be used for the study.

2.3. Data collection

The primary data collected in the study area were purpose of keeping poultry, constraints, feeding, watering, health condition, egg production and egg marketing. Semi-structured questionnaire was prepared to collect important information from the respondent where as the secondary data was obtained from published research work and agricultural office.

2.4. Data analysis

Data collected were analyzed using (SPSS 16, 2007). Survey results were reported using descriptive statistics such as percentage and presented in the form of tables, graphs and charts. The descriptive statistical method such as percentage, mean and frequency were used to analysis the quantities source of data. A priority index was used to rank the constraints of poultry production according to their severity and opportunities based on their relative importance using the following formula: Priority index (PI) = (F1X3) + (F2 X 2) + (F3 X 1)

F total

F1= Frequency of the first rank

F2= Frequency of second rank

F3 = Frequency of third rank

FT= Frequency of total respondents

3. RESULTS AND DISCUSSION

3.1.Socio-economic characteristics and respondentsProfile

The interviewed households were from *Marako* Woreda *Gurage* Zone, Southern Ethiopia. As indicated in table 1 from the total of 100 households' interviewed 80% were males and 40% were females. This finding is nearly similar to Solomon *et al.*, 2013 who indicated that from the total households interviewed 69.4% were males and 31.6% were females. Overall, 50% of the households were followers of the Muslims Christian church and the rest 40, 10% were Protestants and Orthodox, respectively.

Table 1 Sex of the respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Male headed	80	80.0	80.0	80.0
Female headed	20	20.0	20.0	100.0
Total	100	100.0	100.0	

Source: own survey

The majority (80%) of the respondents' age of the household has an age of between 15-50, and the lowest (20%) were above 50 years (table 2). The present finding is slightly in line with (Wondu *et al.*, 2013) who

concluded that above 42% of the household have an age of between 20-50, and the lowest (5%) were range 61-70 years in Northern Gondar, Amhara Regional State, Ethiopia. Majority (50%) of the respondents of poultry producers in this study were married. While, 30% were single. However 15% and 5 % were widowed and divorced.

Table 2. Age of the respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Age				
15-25	30	30.0	30.0	30.0
26-50	50	50.0	50.0	80.0
51-75	20	20.0	20.0	100.0
Total	100	100.0	100.0	

Source: own survey

Majority (80%) of the respondents of poultry producers in this study attend formal education i.e. basic, primary and junior education. While 20% were illiterate (Fig 1). Education is an important factor which if lacking can negatively impact on future improved poultry and livestock production. Thus, farmers involved in poultry rearing need to get basic education, for the reasons of adopting new technologies. The land size of the respondents was on average 2.20 hectare. As it is indicated in figure 3, 40% of the respondents have 2 hectare of land whereas 10% of the respondents have 3 hectare of land.

Fig. 1 Educational level of the respondents

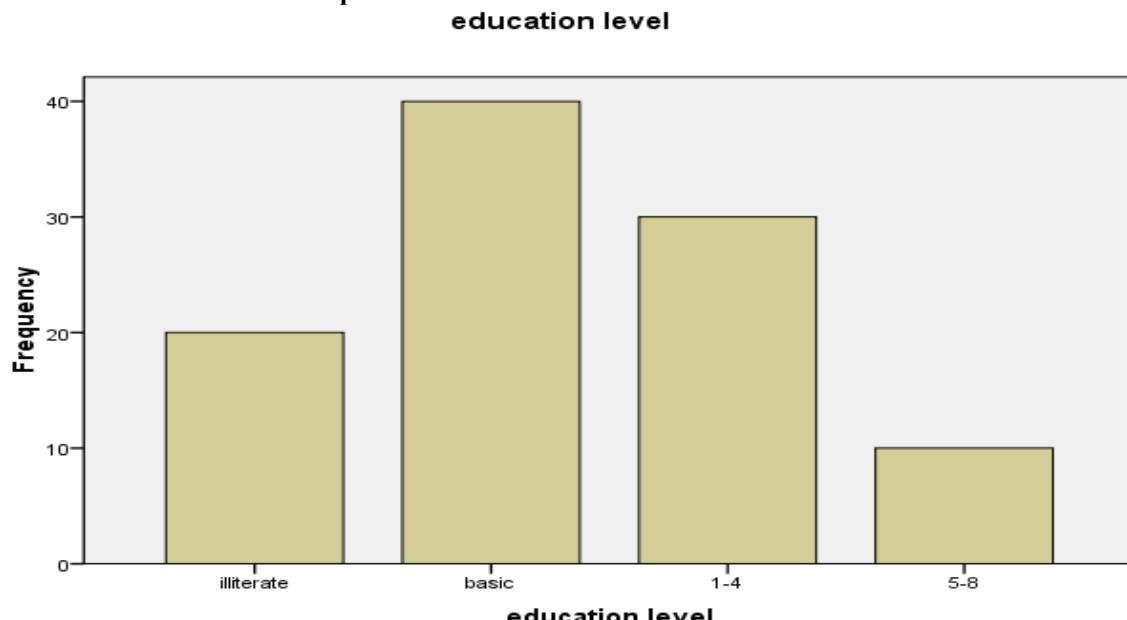
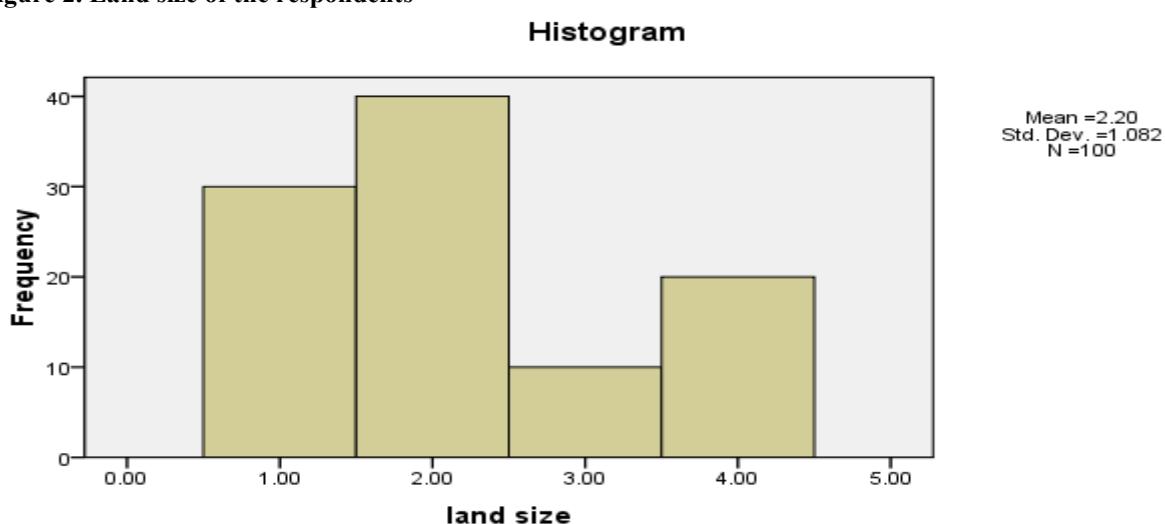


Figure 2. Land size of the respondents



3.2. Poultry production

3.2.1. Flock composition

As indicated in table 3, the flock composition and structure in the study area were laying hens (27%), followed by cocks (25.4%), pullets chicks (23%) and cockerels (21%). The relatively higher proportion of laying hens per household in the study area might be because of the interest of the farmers for increased egg production and using laying hens as parent stocks for hatching as the sources of replacement. The mean flock size recorded in this study was 4.82 which was slightly lower than the report of Feleke *et al.*, (2015) for *Arbegona Woreda, Sidama Zone*, southern Ethiopia (7.93). However, the result was higher than the report of the national average (4.1) as reported by CSA (2009).

TABLE 3: Flock size and structure in the study area

Flock composition	Min.	Max.	Sum	Mean	Percentage (%)
Cock	15	37	127	25.4	26.35
Hen	17	40	135	27	28.01
Pullet	15	35	115	23	23.86
Cockerel	15	30	105	21	21.78
Total			482		100
Average flock size			482/100=4.82		

3.2.2. Purpose of keeping chickens

The result of the present study indicated that keeping of chickens is widely practiced in the study area. The majority (60%) of the respondents were keep chickens for the purpose of sale to increase income (table 4). Whereas 20% of the respondents keep chicken in varying number of flock size aiming of producing egg and meat for household consumption. Similarly, the rest of the respondents 20% keep chickens for saving purpose. The finding of the present study is in line with Halima *et al.* (2007) who illustrated that, income generation and household consumption are the main production objectives of keeping village chicken in Ethiopia.

Table 4: purpose of rearing of chicken

	Frequency	Percent	Valid Percent	Cumulative Percent
Saving	20	20.0	20.0	20.0
Home consumption	20	20.0	20.0	40.0
Sale	60	60.0	60.0	100.0
Total	100	100.0	100.0	

3.2.3. Extension services

The respondents were asked whether they have access to extension services or not. Based on the result of the survey the majority respondents (70%) were got extension service. However, the rest 30% still lack extension service. Therefore, extension service should be given to the poultry producers to improve the poultry production outcome in the study area (table 5).

Table 5: Extension service

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	70	70.0	70.0	70.0
no	30	30.0	30.0	100.0
Total	100	100.0	100.0	

3.2.4. Poultry production system

The results of the study showed that the dominant (70%) chicken production system in the study area is extensive type like free range or scavenging. Chickens were managed mainly on free ranging, utilizing various feed sources searching by their own in the field, with conditional feed supplementation (Table 6). However, (25%) of the respondent farmers practice semi-intensive type of chicken management using fences around their homestead. In the same manner 5% of the respondents rear their chickens in intensive system of poultry production respectively. The findings of the present study slightly agrees with (Melese and Melkamu, 2014) indicated that 83.3% chicken production system in the study area is a free range or extensive type.

Table 6.poultry production system

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	scavenging	70	70.0	70.0	70.0
	Semi- intensive	25	25.0	25.0	95.0
	intensive	5	5.0	5.0	100.0
	Total	100	100.0	100.0	

3.2.5. Feeding and watering experience of farmers

The results of the study showed that all (100%) of the respondent farmers practiced in providing supplementary feed to chicken, which is usually offered 80% supplement with cereal grain like wheat and corn , 15% with mill by products and the remaining 5 % provide concentrate during early in the morning and late in the afternoon(table 7). This finding is in agreement with Halima *et al.* (2007) in northern Ethiopia indicated that 96.8% of the farmers supplied partial supplementation of feeds and 95.5 % of the feed was produced locally. The majority of the respondents (60%) use ground water for their chickens whereas only 9% use the pond water (table 8).

Table 7. Feed supplement type

	Frequency	Percent	Valid Percent	Cumulative Percent
	cereal grain	80	80.0	80.0
	mill by products	15	15.0	15.0
	concentrate	5	5.0	5.0
	Total	100	100.0	100.0

Table 8. Water source

	Frequency	Percent	Valid Percent	Cumulative Percent
	water pipe	20	20.0	20.0
	ground water	60	60.0	60.0
	river	11	11.0	11.0
	pond	9	9.0	9.0
	Total	100	100.0	100.0

The farmers were also asked whether they use water trough or not. Based on the survey result majority (80%) do not use water trough for their chickens (table 9). But a small amount of respondents around 20% use water trough. Based on the present findings it is better to provide different extension approach in order to make farmers use water trough for their chickens. Majority (60%) of the respondents have got their chickens from market by purchasing (table 10). However, a small amount (10%) of the respondents obtained either from gift or donation from some organizations like NGOs.

Table 9. Use of water trough

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	20	20.0	20.0
	no	80	80.0	100.0
	Total	100	100.0	100.0

Table 10.Source of chicken

	Frequency	Percent	Valid Percent	Cumulative Percent
	Purchasing from Market	60	60.0	60.0
	Gift	10	10.0	10.0
	Family	20	20.0	20.0
	Other (NGO:s)	10	10.0	10.0
	Total	100	100.0	100.0

3.2.6. Egg production

The average egg-laying period per hen and average number of eggs laid per hen are also estimated in the study area. Consequently, 70% and 30% of the respondents argued that the average number egg-laying period per hen per year is about 4 and 5, respectively (Fig. 4). This finding agreed with (CSA, 2015) that indicated the national average number egg-laying period per hen per year is about 4 for the local breeds. The respondents are also asked about the number of eggs laid per hen per egg-laying period. Based on the survey result majority (50%) of the respondents responded that average number of eggs laid per hen per egg-laying period is 12. This result is in line with CSA, 2015 which is about 12 in the country level (fig 5).

Average Number of Egg-laying Period/Year

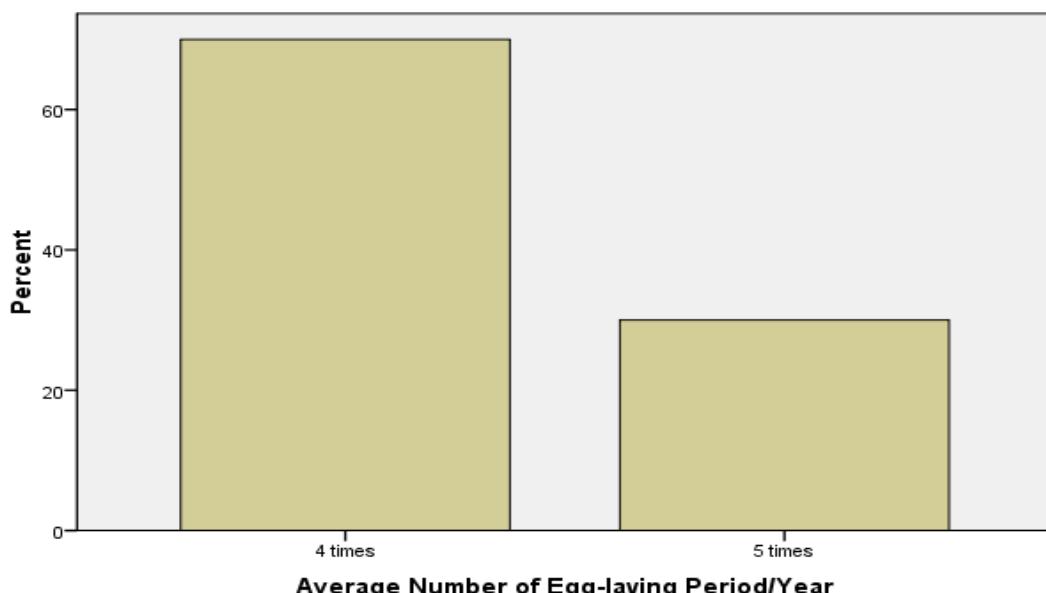


Fig.4. Frequency of average number of egg-laying period/year

Average Number of Eggs/Hen/Period

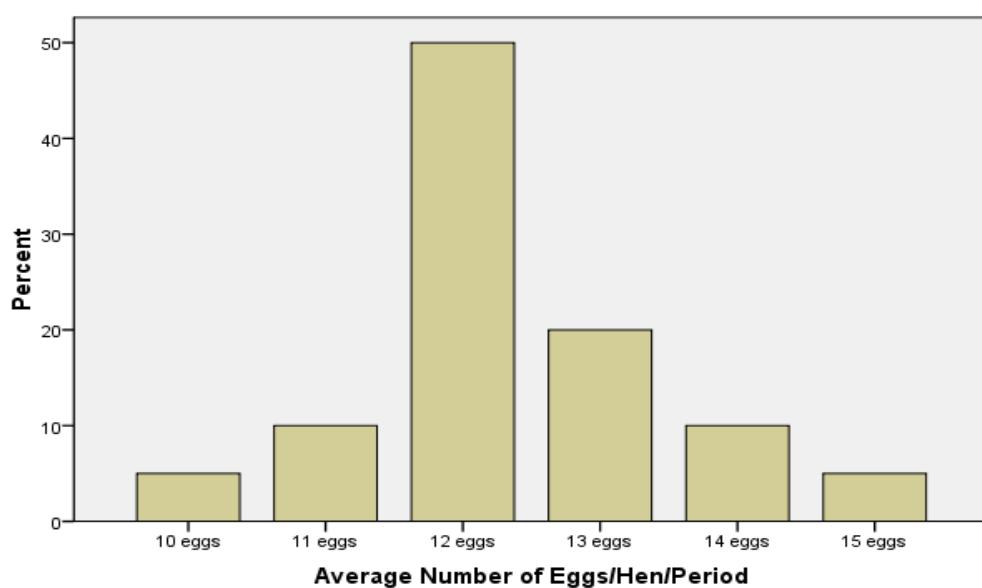


Fig.5. Average number of egg/hen /period

3.3. Constraints of poultry production

From the result of the present study the major constraints of poultry production in the study area were capital, disease, market, predator and feed shortage in the order of rank. The major causes of death of chickens over the study area were seasonal outbreaks of chicken diseases, specifically Newcastle disease. The highest chicken

death rate was observed during the beginning of rainy season and all the respondents reported occurrences of chicken diseases. However, there was a problem in identifying the real causes and the type of diseases that led to chicken deaths since most of the veterinary services given to the farmers were not supported with laboratory investigation.

4. SUMMARY, CONCLUSIONS AND RECOMENDATIONS

This study was conducted to determine the opportunities and challenges of poultry production in *Marako Woreda, Gurage Zone* Southern Ethiopia. It is concluded that the poultry production system is mainly free ranging system where the chickens are allowed to scavenge freely. The mean flock size recorded in this study was 4.82 chickens, the value of which is higher than the national average, 4.1. The result of the study indicated that poultry production in the study area contained many problems such as shortage of money or capital being the most serious, disease as the second, market as the third and predator as the fourth problem. However there are different constraints that hinder poultry productivity there are some opportunities like market access, feed availability and extension service in the study area. It was also indicated that the majority (60%) of the respondents were keep chickens for the purpose of sale to increase income indicating that poultry and poultry products are among the farm products that generate house income. Therefore, appropriate intervention in chicken disease and predator control activities, breed improvement strategies, providing awareness about management of poultry production by training to farmers focusing on disease prevention, improved housing, feeding and watering of chicken and means of credit access for the farmers are recommended to improve productivity of chicken in the study area.

5. REFERENCES

- Alemu yami, 1995. poultry production in Ethiopia. *World's poultry science journal*. 51: 197-201
- CSA (Central Statistics Authority), (2009). Agricultural sample survey report on livestock and livestock characteristics, Addis Ababa, Ethiopia,. pp 35.
- CSA, 2015. Federal Democratic Republic of Ethiopia Central Statistical Agency. Agricultural Sample Survey 78 (2012/13 [2005 E.C). Volume II, Report on Livestock and Livestock Characteristics. Statistical Bulletin 570. Addis Ababa, Ethiopia.
- Feleke Assefa, Teka Tadesse, Abeba Dancho. (2015). Challenges and Opportunities of Village Poultry Production in Arbegona Woreda, Sidama Zone, Southern Ethiopia Vol.5, No.11.
- Gueye, E.F., 2005. Family poultry must no longer be a “Hidden Harvest”, In: International Network for Family Poultry Development (INFPD), FAO, No. 1, (15) January- June, 2005.
- Halima H., Neser F.W.C., Marle-Koster E., Kock A. (2007). Village-based indigenous chicken production system in north-west Ethiopia. *Trop. Anim. Health Prod.*;39:189–197.
- Melese Gashu Nigatu and Melkamu Bezabih. (2014). Assessment of Chicken Production under Farmers Management Condition in East Gojam Zone, Amhara Regional State, Ethiopia. *Greener Journal of Animal Breeding and Genetics*. 1 (1), pp. 001-010.
- MWAB (2008). Marako Woreda Agricultural Development Office Annual Report. May 2008.
- Reta Duguma, 2009. Understanding the role of indigenous chickens during the long walk to food security in Ethiopia. *Livestock Research for Rural Development*. (21) 116.
- SPSS (Statistical Procedures for Social Sciences), 2007. SPSS User’s guide version 16.0. SPSS Institute Inc., Cary NC.
- Tadelle Dessie, Million Tadesse, Alelu Yami and K.J. Peters, 2003. Village chicken production systems in Ethiopia: 2. Use patterns and performance valuation and chicken products and socio-economic functions of chicken; *Livestock Research for Rural Development* (15) 1. Retrieved September 6, 2011, from <http://www.lrrd.org/lrrd15/1/tadeb151.htm>
- Wondu, M., Mehiret, M. & Berhan, T. (2013). Characterization of Urban Poultry Production System in Northern Gondar, Amhara Regional State, Ethiopia. *Agriculture and Biology Journal of North America* ISSN Print: 2151-7517, ISSN Online: 2151-7525, doi:10.5251/abjna.2013.4.3.192.198 ©2013, ScienceHuβ, <http://www.scihub.org/ABJNA>