



Review of the Socio-economic Importance of Village Poultry Production in Ethiopia

Alemayehu Oljira

Department of Agricultural Economics and Agribusiness Management
Jimma University College of Agriculture and Veterinary Medicine
Jima, Ethiopia
alemayehu2016@gmail.com

Abstract

This paper sought to review the socioeconomic importance of village poultry production in Ethiopia. The review indicated that poultry has played, and still plays important social and cultural roles in the life of rural people for building social relations with other villagers. The review also confirmed the widely recognized contribution of smallholder poultry keeping to the income and internal household position of women. However, there is generally a scant literature on poultry marketing system in the country, the limited research showed that a large number of marketing agents are involved along the poultry marketing chain where on average a trader handles between 40 to 100 chickens per week while the middle man manages 2000 eggs per month. Moreover the review identified that the average number of birds that are sold at local markets ranges from 30 to 400 per day. The chicken and egg marketing channels in the country are informal and poorly developed where chicken and eggs are sold to consumers within the villages, on roadsides and in local and urban markets. Furthermore input supply system for exotic breeds is poorly developed or nonexistent and characterized by high price and inconsistent availability if it exists. The input supply system for local breeds is also poor and inconsistent in availing inputs like compound feed and veterinary services that cannot be found in local market places. Even if it existed, characterized by high price and found in long distance from the farmers resident. Finally the current review identified that such poorly developed poultry input supply system can have adverse effect on the productivity and profitability of the subsector.

Key words: village poultry, socioeconomics

Introduction

Background

Ethiopia is one of the largest countries in the world where village poultry plays a dominant role in total poultry production and marketing. The population of poultry is estimated to be more than fifty million (CSA 2013). Although, modern farms have recently been established and slightly expanded mainly in the capital (Addis Ababa) and nearby cities, their share from total national poultry production is still insignificant. Village poultry contribute almost 99% of the national egg and poultry meat production (Dessie et al., 2003). Birds are owned by individual households and are maintained under a scavenging system, with few or no inputs for housing, feeding and health care. Village poultry keeping significantly contributed to the livelihoods of poor households: economically as starter capital, as a means to recover from disasters, as an accessible protein source and for income and exchange purposes, and socio-culturally for hospitality and exchange of gifts to strengthen social relationships (Aklilu et al. 2008).

According to Aberra (2000) rural chicken in Ethiopia represents a significant part of the national economy in general and the rural economy in particular and contribute to 98.5% and 99.2% of the national egg and chicken meat production, respectively. However, the economic contribution of the sector is still not proportional to the huge chicken numbers, attributed to the presence of many technical, organizational and institutional constraints. Birds are owned by individual households and are maintained under a scavenging system, with few or no inputs for housing, feeding and health care. Chicken production in the home is mainly the business of the women, who manage them freely and without any traditional feedback required of the husband. This provides for a measure of economic security to the women in the house. Live birds and eggs are usually sold by the owner in local markets. Single bird sales or sales of small numbers typify most rural markets, with many sellers competing. According to Dessie and Ogle (2001), the numbers and the prices of birds in the market

rise considerably because of high demand during times of festivity. Occasionally birds are sold to middlemen for transport and sales in the larger towns and cities.

Village poultry production is part of a balanced farming system, plays an important role in the supply of high quality protein to the family food balance, and provides small disposable cash income in addition to the socio-religious functions important in the rural people's lives however, the sector is characterized by low input-low output levels attributed to a range of factors such as suboptimal management, lack of supplementary feed, poor marketing performance, low genetic potential and high mortality rate. Although village poultry make up by far the largest element in the national poultry production system, relatively little research (Tadelle *et al.*, 2002) has been carried out to characterize, understand and develop village poultry marketing systems in Ethiopia. Therefore it is important to review the socio-economic roles, opportunities and constraints of village poultry production in Ethiopia.

Objectives of the Review

The objectives include:

- ❖ to review socioeconomic importance of village poultry keeping in Ethiopia
- ❖ to review opportunities and constraints of village poultry production and marketing in Ethiopia
- ❖

Review Methodology

A systematic review method was used to review literature related to livelihood importance of village poultry keeping in Ethiopia. A realist review approach was used. The realist approach builds up on the principles of the Cochran systematic review, however seeks explanation, rather than empirical truth (Pawson *et al.*, 2005). The realist review often includes tighter inclusion criteria and a small number of documents than other review approaches, with a focus on depth rather than breadth and the use of predominantly qualitative critical analyses. This method provides an appropriate tool to understand the socioeconomic importance of village poultry

production. To include only up to date information, a maximum time frame of 10 years is usually placed on the age of the works to be included in the review. Manual searching and Google scholar search strategies were performed in this literature review from different data bases. Finally, the full text documents were assessed to evaluate the relevance of the paper particularly for this review. Papers both published and unpublished in English language were included in this review.

Literature Review

Poultry Production System in Ethiopia

Poultry production in Ethiopia can be categorized in to three major production systems. These are traditional poultry production system, small scale intensive and commercial poultry production system based on some selected parameters such as breed, flock size, housing, feeding, health care, insecurity and other technologies (Halima et al., 2007).

The traditional poultry production system is characterized by a low level of input and output. It is especially favorable to small holder farmers due to its low capital requirement, high cost efficiency, flexible production systems and low production risk. The production contributes over 98% national egg and over 99% poultry with annual output of 78,000 metric tons of eggs and 72,300 metric tons of meat. Also there are emerging small scales market oriented intensive system in urban and pre-urban areas holding small number of exotic breeds of chickens (50-1000) and are produced along commercial lines using relatively modern management methods (Alemu & Tadelle, 1997). The commercial poultry production system contributes nearly 2% of the national poultry population in Ethiopia. It is highly intensive production system which holds greater or equal to 10,000birds. The system is characterized by indoor conditions with a medium to high bio-security level, holds imported exotic breeds that require intensive inputs such as feed, housing, health and modern management system.

Socioeconomic Importance of Village Poultry Production in Ethiopia

In Ethiopia marketing of chicken and eggs is one of the functions of keeping free range chickens by smallholder farmers. Village chicken and eggs are sold in local and urban markets to traders or directly to consumers depending on the location of the farm dwelling. According to Assefa and Halima (2007), smallholder village chicken owners found in different parts of the country sell chicken and eggs to purchase food items, to cover school fees, to get cash for grain milling services, to purchase improved seeds and to adjust flock size. Tadelle (2001) also reported that few farmers in central highlands of Ethiopia exchanged their free-range chicken for food and household items. The impact of village chicken in the national economy of developing countries and its role in improving the nutritional status, income, food security and livelihood of many smallholders is significant owing to its low cost of production (Gondwe 2004; Abdelqader 2007; Abubakar et al. 2007).

Family chicken are rarely the sole means of livelihood for the family, but is one of a number of integrated farming activities contributing to the overall well-being of the households. It provides employment and income generating opportunity and is a priority animal for holy day and religious sacrifices (Sonaiya 2000; Tadelle & Ogle 2001; Gueye 2003). Village chicken also plays a role of converting household leftovers, wastes and insects into valuable and high-quality protein (Doviet 2005). There are only few alternative animal protein sources available in the tropics including chicken and eggs (Odunsi 2003). Family chicken meat and eggs contribute 20–30% to the total animal protein supply in low-income and food-deficit countries. According to Tadelle (2003), in Ethiopia, village chicken production systems are characterized by low input–low output levels.

Muchenje et al., (2000), reported a range of factors such as suboptimal management, lack of supplementary feed, low genetic potential and high mortality rate are the major causes for the apparent low output level. However, village chicken production is part of a balanced farming system, plays an important role in the supply of high-quality protein to the family food balance, and provides small

disposable cash income in addition to the socio-religious functions important in the rural people's lives. Chickens provide major opportunities for increased protein production and incomes for smallholder farmers because of short generation interval, high rate of productivity, the ease with which its products can be supplied to different areas, the ease with which its products can be sold due to their relatively low economic values, its minimal association with religious taboos and its complementary role played in relation to other crop–livestock activities.

Poultry production can potentially play several important roles. First, poultry products offer affordable quality animal protein sources for the smallholder farm households. Research results in Bush (2006) however showed that rural households consume a very limited quantity of poultry products because they rank cash income as the primary purpose of village chicken production. Its consumption is moreover closely associated with wealth status where the poorer the household, the fewer poultry products are eaten. Chickens are not a daily food even for a better-off household but consumed mostly during holidays. In general, poultry consumption accounts for less than 1% of the total annual food needs of farm households.

Rearing of indigenous poultry offers farmers nutritional, socio-cultural and economic benefits. In backyard production system, women are mainly responsible for rearing poultry. The income earned from poultry keeping is used to buy food and clothes for children. Poultry and egg offer a quality protein source throughout most of the year and play a role in food security. The level of consumption and sale of chickens and eggs varies during the year. There is an increase in chicken and eggs consumption during the Ethiopian New Year, Christmas and Easter holidays (Nzietchung 2008).

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. It has also become common for live birds to be given to very sick people. Cocks are used as alarm clocks of dawn and as offerings to deities. Poultry

(mainly local) also have mystical uses where villagers in some parts of the country believed bad spirits that target a family member can be diverted with white feathered chickens. This explains why many households want to keep at least one chicken in their compound. In general, socio-cultural roles were more important in the area with the poorest market access. Chickens 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 & Ogle, 2001).

Poultry meat and eggs are relatively cheap and affordable sources of protein for most consumers compared to other animal products such as beef. Consumption of poultry products is more common in urban than in rural areas and commonly high during holiday periods. Price of chicken is highly related to holy days, non-fasting season for the Orthodox Christians, plumage colour, comb type, size, age, sex, market site and health status of chicken (Halima, 2007). Local breeds are considered to be the only birds fit to use for spiritual sacrifice and for gifts (Tadelle & Ogle 2001). Aklilu et al., (2007) documented how prices can rise to more than twice their normal levels during the main social and religious festivals. Houndonougbo (2005) also reported significant price fluctuations associated with seasons and festivals in Benin.

Poultry are used for strengthening marriage partnerships in northern part of Ethiopia. In the local culture, particularly in remote areas, 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 (e.g. in-laws), thus strengthening social relationships which is especially important for poor households. There are cultural traditions determining the consumption of poultry that affect nutrition within the household. Customarily, the meatiest and most nutritious parts of the carcass are served to men, for example, the meat on the gizzard, drumsticks and

breast bones. It is believed that meaty viscera are especially good for improving the strength of old men and increasing their libido. Lower-quality parts like the neck, wings and skin are served to women and children. A consequence is that men consume more poultry meat (Akililu, 2007).

A study conducted by Samson and Endalew (2010) in Riftvalley areas of Oromia, indicated that village poultry production is used as a source of income for immediate household expenses. Majority of village chicken production were owned by female and children. This indicated that most of the time women and children are responsible for chicken rearing, while the men are responsible for other farm activities. Chicken and eggs are usually taken to the local market by women and children and sold to traders or directly to consumers. The decision maker for egg and chicken sell and home consumption are husband and wife.

In Ethiopia, there is scant literature covering the gender effects of developments in the poultry sector. The gender effects would relate to intra-household dynamics in terms of division of labor, access to and control of resources and benefits among household members. In this respect, Bush (2006) tried to assess the gender dimension in an attempt to predict the likely income impacts of avian flu on women based on selected study sites in southern Ethiopia. In the study, it was estimated, based on the results of a village research, that a woman would have an annual cash income of Birr 200. Here, it should be noted that this estimate would be much higher if current poultry prices have been used. Moreover, it was found that variability of poultry income is closely associated with wealth status and women do sell a mix of chicken and eggs to optimize their poultry income.

Opportunities of Village Poultry Production and Marketing in Ethiopia

Village poultry production also avail ample opportunities compared to other alternative investments in rural areas particularly. It requires less labuor and capital, management and technical skill in which rural

communities have comparative advantages. The increasing price of animal products within and abroad also provides real and sustainable business opportunity for the rural poor (Awal, 2010).

The growth in global demand for meat and other livestock products is tremendous – fueled by population growth, economic growth, urbanization, changing diets and reductions in the relative prices of livestock products. The market for poultry meat is growing faster than that for any other meat product, and is projected by the International Food Policy Research Institute (IFPRI) to maintain this position in the coming decades (Delgado *et al.*, 2001). Rising demand has fueled a structural change in the production and supply of poultry meat, with production for the global market concentrated in the hands of relatively few large companies, characterized by vertically integrated production and marketing. Indigenous chicken provides major opportunities for increase in protein production and income for smallholder farmers. They have a short generation interval and a high rate of productivity. They can also be transported with ease to different areas and are relatively affordable and consumed by the rural people as compared with other farm animals such as cattle and small ruminants. Indigenous chickens are good scavengers as well as foragers are said to have good level of disease tolerance, possess good maternal qualities and are adapted to harsh conditions and poor-quality feeds as compared to the exotic breeds. In some communities village chickens are important as starter of livelihood improvement.

Backyard poultry production contributes significant role to food security, poverty alleviation especially for the poorer members of the community by diversifying agricultural production including increased distribution of resources through involvement of women and ecologically sound management of natural resources. It is also a source of employment for underprivileged groups in many local communities (Mengesha *et al.*, 2008). Moreover, indigenous chickens are known for their merits such as broodiness behavior with high fertility and hatchability, disease resistance thermo tolerant, good egg and meat flavor, hard eggshells, productivity at zero or minimal feed

supplementation and high dressing percentage (Abera, 2000) that matches with the poor family poultry production systems.

Dessie and Ogle (2001) revealed that poultry, especially in the small-scale scavenging village context, can make considerable contributions to poverty alleviation and in the supply of high-quality protein. They have a high reproduction rate per unit time, are efficient in transforming otherwise largely unusable protein and energy into human food and require very little capital investment. Consumers overwhelmingly prefer local to exotic birds and eggs, and hence, in local markets, an indigenous bird of 1.25 kg live weight and its 40g eggs (or lighter) command the same prices as exotic birds of 1.5 kg and eggs of 60g. The premium for local birds is attributed to better their meat flavor and more deeply colored egg yolks. Small scale scavenging production could be an effective means of transfer of wealth from higher income urban consumers to poorer and poor rural and peri-urban members of the community. Many producers recognize the contribution of poultry to an improved diet that is higher in animal protein and thus promotes better growth in children and improved health in adults.

Village chickens require limited amounts of inputs such as land, feed, vaccination, housing and time. These birds are able to survive under poor management but are still able to produce meat and eggs that are used by farmers for various purposes such as income generation, basis of bartering, source of manure and consumption. Village chicken products have also obtained preference to many people mainly for better taste, freshness, color of the carcass and yolk (Mtileni *et al.*, 2009). In Kenya, Tanzania and Ethiopia, rich households that do not own village chickens buy village chicken meat through food retail centers at premium price (Aklilu *et al.*, 2007). This indicates that resource-poor households should exploit advantages of rearing these chickens as they have short generation intervals for rapid increase of flock sizes, thus improvements can be realized in a short run.

Constraints of Village Poultry Production and Marketing in Ethiopia

Village chickens are widely distributed across resource-poor households of Africa. These birds are reared by almost every rural

household that is surviving below poverty line (Gueye, 2002). Thus poverty and hunger continue to adversely affect communal regions due to inefficient use of village chickens. So far, programmes focusing on village chickens to alleviate poverty and hunger and create wealth have received little attention, yet they play vital roles in rural livelihoods (Gueye, 2000). Wide distribution of village chickens highlights opportunities of these birds in hunger reduction. The contribution of village chickens to rural households depends upon reasons of rearing that can be demographical, socio-economic and cultural.

There is generally a scant literature on poultry marketing system in Ethiopia. However, the limited research showed that a large number of marketing agents are involved along the poultry marketing chain. For example, Goutard and Magalhaes (2006) have identified the major poultry and poultry products' marketing channels. Here, the marketing channel shows that a large number of middlemen are involved in the marketing chain between producers and consumers and are informal and poorly developed where chicken and eggs are sold to consumers within the villages, on roadsides and in local and urban markets.

Poultry market chain analysis conducted by Awol (2010) in Dale and Alaba districts of southern Ethiopia indicated that input supply system for exotic breeds is poorly developed or nonexistent and characterized by high price and inconsistent availability if it exists. The input supply system for local breeds is also poor and inconsistent in availing inputs like compound feed and veterinary services that cannot be found in local market places. Even if it existed, characterized by high price and found in long distance from the farmers resident. This poorly developed input supply system can have adverse effect on the productivity and profitability of the subsector. This also makes the marketing system function inefficiently to coordinate the flow of birds and eggs between the production and consumption points. The same author also reported that lack of reliable market information, access to credit, shortage of supply and prevalence of disease are the most frequently mentioned constraints

in both chicken and egg marketing system. Lack of packaging material is a significant treat on egg marketing that creates systematic inefficiencies at different stages of the marketing functions across the supply chain.

He also reported that village poultry production system is the most important economic activity in rural poor households. The sector serves as a starter capital stock, source of easily disposable cash income, source of protein and also has crucial social and cultural values. However, disease is among the most distressing constraints in the production and marketing of village poultry products. About 37% of the total respondents pointed out that disease is the most important constraint particularly New Castle Disease (NCD) is most common among others in the study area. Absence of day and night housing, variable inputs and predation are also mentioned economically important challenges in the production and marketing of local birds and egg.

Conclusion

Village poultry make up by far the largest element in the national poultry production system in Ethiopia. The sector represents a significant part of the national economy in general and the rural economy in particular where it contributes to 98.5% and 99.2% of the national egg and chicken meat production respectively. The sector is characterized by low input-low output levels attributed to a range of factors such as suboptimal management, lack of supplementary feed, poor marketing performance, low genetic potential and high mortality rate. However, village chicken production is part of a balanced farming system, plays an important role in the supply of high- quality protein to the family food balance, and provides small disposable cash income in addition to the socio-religious functions important in the rural people's lives. Chickens provide major opportunities for increased protein production and incomes for smallholder farmers because of short generation interval, high rate of productivity, the ease with which its products can be supplied and sold due to their relatively low economic values, minimal association with religious taboos and complementary role played in relation to other crop-livestock activities.

Although village poultry makes up by far the largest element in the national poultry production system, relatively little research has been carried out to characterize, understand and develop village poultry marketing systems in Ethiopia. Rural households consume a very limited quantity of poultry products because they rank cash income as the primary concern of village chicken production. Poultry consumption is moreover closely associated with wealth status where the poorer the household, the fewer poultry products are eaten. Chickens are not a daily food even for a better-off household but consumed mostly during holidays. In general, poultry consumption accounts for less than 1% of the total annual food needs of farm households. The income earned from poultry keeping is used to buy food and clothes for children. Poultry and egg offer a quality protein source throughout most of the year and play a role in food security.

In the local culture, particularly in remote areas of Ethiopia, 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 (e.g. in-laws), thus strengthening social relationships which is especially important for poor households.

The market for poultry meat is growing faster than that for any other meat product, and is projected by the International Food Policy Research Institute (IFPRI) to maintain this position in the coming decades. Rising demand has fueled a structural change in the production and supply of poultry meat, with production for the global market concentrated in the hands of relatively few large companies, characterized by vertically integrated production and marketing. The sector serves as a starter capital stock, source of easily disposable cash income, source of protein and also has crucial social and cultural values however, inefficient marketing system and disease particularly New Castle Disease were among the most distressing constraints in the production and marketing of village poultry products.

Recommendations

About 99 percent of the country's poultry supply constitutes local breeds from rural farm families most of whom live farther away from

market places and where most public goods are in short supply. Thus improving the development of infrastructures in the country as a whole would have solid implications in the development of poultry supply.

Poultry producers' accesses to credit and extension services are important factors determining farmers' participation decision and the level of chickens eggs supplied to market. Therefore village poultry producers should be linked with microfinance institutions to access credit service and extension advisors also should be involved actively to equip producers with training about profitability and untapped productivity potential of village poultry production with minimal increment in inputs usage and management such as application of supplementary feeding, separate night housing and veterinary services.

It was indicated that Newcastle disease (ND) is a major cause of mortality in village poultry. Therefore farmers' awareness has to be raised on the importance of vaccinating their flocks. If vaccination proves to be productive and profitable, even the poor may in the course of time be willing and able to pay for the service.

References

- Abubakar, M.B., Ambali, A. G & Tamjdo, T. (2007). Rural chicken production: Effects of gender on ownership, and management responsibilities in some parts of Nigeria and Cameroon. *International Journal of Poultry Science* 6(6):413–416.
- Abdelqader, A., Wollny, C. B. A & Gauly, M. (2007). Characterization of local chicken production system and potential under different level of management practice in Jordan. *Journal of Tropical Animal Health and Production* 39:55–164.
- Aklilu, H.A., Almekinders, J.M., Udo, H. M. J & Van der Zijpp, A. J. (2007). Village poultry consumption and marketing in relation to gender, religious festivals and market access. *Tropical Animal Health Production* 39, 165-177.

- Aklilu, H. A. (2007). *Village poultry in Ethiopia; Socio-technical analysis and learning with farmers*. PhD thesis, Wageningen University, Wageningen, the Netherlands ISBN: 978-90-8504-679-0
- Assefa, T. (2007). *Poultry management practices and on farm performance evaluation of Rhode Island Red, Fayomy and Local chicken in Umbulo Wachu water shade in Sidama zone*. MSc thesis. Hawassa University, Hawassa, Ethiopia. 126 pp
- Awal, Z. (2010). *Analysis of poultry market chain: The case of Dale and Alaba 'Special' Woredas of SNNPRS, Ethiopia*. MSc thesis Haramaya University, Ethiopia.
- Abera, M. (2000). *Comparative studies on performance and physiological responses of Ethiopian indigenous (Angete Melata) chickens and their f1 crosses to long term heat exposure*. PhD dissertation, Martin-Luther University. Halle-Wittenberg Germany. P. 127.
- Bush, J. (2006). *The threat of Avian Flu Predicted Impacts on Rural Livelihoods in Southern Nation, Nationalities and Peoples Region (SNNPR), Ethiopia*. The Food Economy Group, May 2006.
<http://www.ilri.org/Link/Files/Theme3/Avian%20Flu/Avian%20Flu%20%20Livelihoods%20-%20Final%20Report%202.pdf#search=%22ethiopia>
- Doviet, M. (2005). *Effect of supplementation, breed, season and location on feed intake and performance of scavenging chickens in Vietnam*. PhD thesis. Swedish University of Agricultural Sciences. 45 pp.
- Goutard, F. & Magalheas, R.S. (2006). *Risk and consequence assessment of HPAI*. CIRAD & FAO
- Delgado, C. L., Mark, W. R. & Meyer, S. (2001). *Livestock Revolution to 2020: The Revolution Continues*. Annual meeting of the International Agricultural Trade Research Cons (ATRC), Auckland, New Zealand January 18th-19th, 2001.
- Mengesha, M., Tamir, B., Tadelle, D. (2008). *Socio-economical contribution and labor allocation of village chicken production of Jamma district, South Wollo, Ethiopia*.

Livestock Res. Rural Dev. 20:160. Retrieved from <http://www.lrrd.org/lrrd20/10/meng20160.htm>

Mtileni, B.J., Muchadeyi, F.C., Maiwashe, A., Phitsane, P.M., Halimani, T.E., Chimonyo, M., Dzama, K., (2009). Characterisation of production systems for indigenous chicken genetic resources of South Africa. *Applied Animal Husbandry & Rural Development* 2, 18-22.

Nzietchueng, S. (2008). Characterization of poultry production systems and potential pathways for the introduction of highly pathogenic avian influenza in Ethiopia. *Draft Report*. International Livestock Research Institute.

Dessie, T. & Ogle, B. (2001). Village poultry production systems in the central highlands of Ethiopia. *Tropical Animal Health and Production*. 33 (6): 521-37

Tadelle, D. (2003). *Phenotypic and genetic characterization of chicken ecotypes in Ethiopia*. PhD thesis. Humboldt University, Germany. 208 pp.

Muchenje, V. & Manzini, M.M, Sibanda, S & Makuza, S.M. (2000). Socio-economic and biological issues to consider in smallholder poultry development and research in southern Africa in the new Millennium. A paper presented at the regional conference on animal agriculture and crisis mitigation in livestock dependent systems in southern Africa, 30 October to 1 November 2000, at Malawi Institute of Management, Lilongwe, Malawi. pp. 134–144.

Mogesse, H. H. (2007). *Phenotypic and genetic characterization of indigenous chicken populations in northwest Ethiopia*. PhD thesis. Faculty of Natural and Agricultural Sciences, Department of Animal, Wildlife and Grassland Sciences, University of the Free State, Bloemfontein, South Africa.

- Houndonougbo, F.M. (2005). *Micro Credit Impact in Family Poultry Systems*. MSc thesis. The Royal Veterinary and Agricultural University & Network for Smallholder Poultry Development, Copenhagen.
- ILRI (International Livestock Research Institute) (1995). *Livestock policy analysis*. ILRI Training Manual 2. ILRI, Nairobi, Kenya.
- Leta, S and Bekana, E. (2010). Survey on village- based Chicken Production and Utilization System in Mid Rift Valley of Oromia, Ethiopia. *Global Veterinaria* 5 (4): 198-203
- Alemu, Y. & Tadelle, D. (1997). The Status of Poultry Research and Development in Ethiopia, pp: 40-60. Being a paper presented at the Fifth National Conference of Ethiopian Society of Animal Production (ESAP), 15-17 May 1997, Addis Ababa Ethiopia
- Halima, H., Neser, F.W.C. & E. Van Marle-Koster de Kock, E. (2007). Village based indigenous chicken production systems in North West Ethiopia. *Trop Animal Health Prod Journal*, 39(3): 189-197.
- CSA. (2013). Statistical analysis report. Addis Ababa. Ethiopia: Central Statistical Authority.
- Aklilu, H.A., Udo, H.M.J., Almekinders, C.J.M. & Van der Zijpp, A.J. (2008). How poor households value and access poultry Village poultry keeping in Tigray, Ethiopia. *Agricultural Systems*, 96, 175-183.
- Dessie, T., Million, T., Alemu, Y. & Peters, K.J. (2003). Village chicken production systems in Ethiopia: Flock characteristics and performance. *Livestock Research for Rural Development*, 15 (1).
- Dessie, T & Nigusie, D & Yami, A & Peters, K. (2002). The feed resource base and its potentials for increased poultry production in Ethiopia. *Worlds Poultry Science Journal* 58. 77-87. 10.1079/WPS20020009.
- Dessie, T. (2001). The role of scavenging poultry in integrated farming systems in Ethiopia. *Livestock feed resources within 55 integrated farming systems*. pp. 377–399. Debre Zeit Agricultural Research Center, Debre Zeit, Ethiopia. Available

- from [http://www.fao.org/Ag/againfo/](http://www.fao.org/Ag/againfo/resources/document/s/frg/conf96pdf/tadelle) resources/document s/frg/conf96pdf/tadelle.
- Gondwe, T.N.P. (2004). *Characterization of local chicken in low input– low output production systems: Is there scope for appropriate production and breeding strategies in Malawi?* PhD thesis. Georg-August-Universität Göttingen, Germany. 184 pp
- Gueye, E.F. (2000). Women and family poultry production in Africa. *Development in Practice* 10:98–102.
- Guèye, E. F. (2002). Employment and income generation through family poultry in low- income food-deficit countries. *World's Poultry Science Journal* 58(4): 501-517
- Gueye, E.F. (2003). *Poverty alleviation, food security and the well-being of the human population through family poultry in low income food-deficit countries*. Senegalese Institute of Agricultural research (ISRA), Dakar-hann, Senegal.
- Sonaiya, E.B. (2000). Family poultry and food security: Research requirements in science, technology and socioeconomics. *Proceedings XXI World's Poultry Congress*, Montreal, Canada. pp. 20–24.
- Odunsi, A.A. (2003). Assessment of Lablab leaf meal as a feed ingredient and yolk coloring agent in the diet of layers. *International Journal of Poultry Science* 2(1):71–74.