

Study on Challenges and Opportunities of Village Chicken Production in Haramaya District, Eastern Ethiopia

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Abstract- Survey on rural chicken production system was conducted in three peasant associations of Haramaya Woreda of Oromia regional state to generate information on the problems and constraints emending the developments of their community with particular emphasis on poultry production and to list the possible opportunities and strategies that could solve these problems. A total of 120 households were used for the survey work. Finally, all the data collected were analyzed using descriptive statistics. About 77.5% of all the respondents share family dwellings with poultry, attributed to the small flock size, low priority given to chicken and relatively high cost of poultry house construction. The results obtained clearly showed that poultry diseases are widely spread in the Woreda and farmers pointed out that, Newcastle Disease, fowl cholera; respiratory diseases and predators are responsible for the major losses of birds in the study sites. Almost all the respondents reported poultry and poultry product market price fluctuation attributed to limitation in land holding, disease occurrence and low purchasing power of the consumers. About 100% of the respondents reported to keep different classes of chicken together, the practice of which facilitates transmission of diseases. In summary the results of this study tends to indicate that production performance of indigenous chicken is low under traditional production practice and need to be improved.

Index Terms- Indigenous chicken, Haramaya, Survey, Traditional

I. INTRODUCTION

Poultry refers to all domestic birds, kept for production of meat and eggs for human consumption such as chicken, turkey, ducks, geese, quails, ostrich, and guinea fowl (Kekeocha, 1984). The total Ethiopian poultry population is estimated to be 56.5 million of which 99% is made up of indigenous chickens (ILCA, 1993). Majority of the national chicken population 41.7% comprises of chickens 0-8 weeks of ages, characterized by high mortality of about 40-60%. The laying flock seems to be dominated by old age and surplus breeding males. About 30.9% of the total national chicken population is hens of which about 16% are none layers. The four regional states (Oromia, Amhara, SNNP, and Tigray) collectively accounts for about 96% of the total national poultry population. Chicken rearing is not common in lowland of Ethiopia i.e. Somali, Gambella, Afar, and Benishangul-Gumuz regional states which collectively own

3.24% of the total chicken population of which 2.2% is owned by Benishangul-Gumuz regional state (CACC, 2003).

The Ethiopian indigenous chickens are none descriptive breeds closely related to the Jungle fowl and vary in color, comb type, body conformation and weight and may or may not possess shank feather. Broodiness (maternal instinct) is pronounced (Demeke, 2008). They are characterized by slow growth, late maturity and low production performance. The mean annual egg production of indigenous chickens is estimated at 60 small eggs with thick shell and deep yellow yolk color (Yami and Dessie, 1997). Egg laying period and number of eggs laid per period are to some extent higher in urban than in rural areas (CACC, 2003).

The productivity of local scavenging hens is low, not only because of low egg production potential, but also due to high chick mortality. About 40-60% of the chicks hatched dies during the first 8 weeks of age (Hoyle, 1992, Tadele, 1996, and CACC, 2003) mainly due to disease and predator attack. It is estimated that, under scavenging conditions, the reproductive cycle consists of 20 days laying phase, 21 day incubation phase and finally a 56 days brooding phase (Alemu yami and Tadele dessie, 1997). This implies that the number of clutches size per hen per year is probably 2-3. Assuming 3 clutches per hen per year, the hen would have to stay for about 168 days out of production every year, entirely engaged in brooding activities.

The developments of innovative ideas for improving real poultry production require complete understanding of the system and its operators. Furthermore, research directions and strategies should be geared to addressing farmer real problems and constraints so as to help them expand and become self-sufficient. Hence important element is in the sustainable development of community is the active involvements of the community members in any development activities, which should start with their participation in identifying their own problem and constraints and deciding on the best alternatives and most appropriate strategies to meet such needs. There is, therefore, present study was designed to identify residents problems and constraints emending the developments of their community and to list the possible opportunities and strategies that could solve these problems.

II. MATERIALS AND METHODS

Study Area

The study was conducted in Haramaya district of east Hararghe zone of Oromia regional state. It is located 15km North

of Harar capital city. Haramaya district is located in eastern Hararghe with altitude 1403 meters and maximum and minimum annual temperature is 20°C and 15°C, respectively. Its annual rainfall is 1290mm.

Research Design and Methodology

The study was conducted through informal survey and diagnostic (formal) survey. Informal survey was used to describe the study area, to obtain base line data (secondary data). It was also used to collect data on general characteristics of the area like administrative boundary, agro-economic condition; physical, biological and socio-economic, demographic and institutional interventions on livestock production in general and particularly on challenges of chicken production at small scale data were collected through informal survey.

Focus group discussions were held with key informants. Moreover, direct observations were used to assess the current activities undertaken in relation to constraints and problems emending the developments of their community with particular emphasis on poultry production like the biophysical, economic and socio-cultural aspect of poultry production in the selected communities. And the possible opportunities and strategies that could solve these problems as well as possible entry points for introducing sustainable poultry developments to the area.

The information generated during the informal survey was used for the development of the questionnaire for the formal survey. Besides the information obtained from informal survey, the questionnaire will include the empirical knowledge from the researcher as well as consultation of experts in the zone agriculture office. In addition, relevant literature was consulted. The questionnaires were pre-tested on some sample households.

Sampling Procedure

Based on the information obtained during the rapid survey, the study sites were stratified and similarly the sample householders were also selected. All the sampling procedures were undertaken with the consultation of the responsible personnel in the office of zone agriculture and rural development.

Data Management and Analysis

The raw data collected from the survey work was entered in excel for data management. The data were analyzed using descriptive statistics.

III. RESULTS AND DISCUSSIONS

Livestock Possession and Flock Structure

The average reported livestock possessions are presented in Table 1. Respondents in Bate had significantly higher number of goat and chicken. However, there was no significant difference among three kebeles in donkey holding.

Table 1. Livestock holdings per households in the study area

Categories	Bate (n=40)	Tinike (n=40)	Adele (n=40)	Overall (n=120)
	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE
Cattle	1.33±0.2	1.80±0.2	1.80±0.2	1.63±0.1
Sheep	2.43±0.3	2.35±0.3	2.60±0.3	2.45±0.2
Goat	3.53±0.5	3.90±0.5	3.58±0.5	3.66±0.3
Donkey	0.25±0.1	0.28±0.1	0.28±0.1	0.27±0.0
Chicken	9.18±0.8	8.52±0.7	6.5±0.5	8.07±0.4

	SE	SE	SE	SE
Cattle	1.33±0.2	1.80±0.2	1.80±0.2	1.63±0.1
Sheep	2.43±0.3	2.35±0.3	2.60±0.3	2.45±0.2
Goat	3.53±0.5	3.90±0.5	3.58±0.5	3.66±0.3
Donkey	0.25±0.1	0.28±0.1	0.28±0.1	0.27±0.0
Chicken	9.18±0.8	8.52±0.7	6.5±0.5	8.07±0.4

SE=standard Error

The mean average of adult hens accounted for about 4.20 ± 0.17 of the total flock. The mean average of hens (4.35 ± 0.35) was larger for Bate as compared to Tinike and Adele which are (4.01 ± 0.27) and (4.23±0.27) hens respectively. The lower proportion of pullets, Cockerels and chicks in all kebeles is related to the tradition of marketing young chicks. The flock structures in the all kebeles are listed below:

Table 2. Chicken flock structures in the study area

Categories	Bate (n=40)	Tinike (n=40)	Adele (n=40)	Overall (n=120)
	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE
Cocks	1.08±0.2	1.15±0.2	1.13±0.1	1.12±0.1
Hens	4.35±0.4	4.01±0.3	4.23±0.3	4.20±0.2
Pullet	2.10±0.3	2.2 ±0.3	2.10±0.3	2.13±0.1
Cockerel	1.45±0.2	1.70±0.2	1.48±0.2	1.54±0.1
Chicks	2.55±0.5	2.60±0.5	2.75±0.4	2.63±0.3

n= number of households; SE=standard error

Chicken Production Practices

Housing

The results of this study showed that, there are no separate poultry houses in the study areas in most of the cases (Table 4) and village chickens spent most of their time scavenging in the vicinity of human dwellings. About 77.5% of the respondents' households keep poultry in the same room with human being during night time as shown in Table 4. On the other side 11.67% household reported to have separate partition as night time enclosure for poultry within family dwellings. The remaining respondents reported to have separate poultry houses. The general indication is that about 77.5% of all the respondents share family dwellings with poultry, attributed to the small flock size, low priority given to chicken and relatively high cost of poultry house construction. Sharing family dwellings particularly during night times might also be associated with protection from predators.

The results of the discussions made with key informants indicated that most of the farmers of the study area are not aware of the importance of separate poultry house construction from the point of view of productivity and bio-security. Moreover, the separate poultry houses constructed in the study area lack internal facilities like egg laying nest, roosts and feeder. This result is in agreement with the findings of Kitaly (1998) and the

Resource-Center (2005) who reported that both in Ethiopia and in Kenya, the majority of chickens are housed either in family dwellings or in the kitchens.

About 25, 42.5 and 32.5% of all the respondents reported to clean their poultry houses daily, weekly and twice a week, respectively. Lack of frequent cleaning of poultry shelter could easily cause diseases conditions and increase morbidity and mortality.

Table 4. Housing of Rural chickens by the households in studied Kebeles (%)

Housing types	Bate	Tinike	Adele	Overall
Share the same room with family	72.5	77.5	82.5	77.5
Have a different shelter for night enclosure in the same roof	15	12.5	7.5	11.67
Separate house constructed entirely for chicken	12.5	10	10	10.83

There is no well recognized design for the construction of poultry house in the study area and most of the available poultry houses are constructed from sorghum stalk and bamboo trees. The result of this study is in line to the report of Meseret (2010) who reported that Bamboos and sticks are occasionally used for construction of perches within the family houses in Gomma Woreda.

Feeds and feeding

There is no purposeful feeding of rural household chickens in Ethiopia and the scavenging feed resource is almost the only source of feed. According to the results of this study, all of the respondents (100%) reported to practice scavenging system with supplementary feeding. This result seems to be in line with that of Bassei (1993), Tadelle (1996) and Maphosa *et al.* (2004) who stated that village chickens don't receive regular and adequate supplementary feeding.

All the respondents reported that baby chicks and layers are given priority for supplementary feeding. According to the results of the discussion made with the key informants priority of supplementation is given to young chicks since young chicks could not fulfill part of their nutritional requirement by scavenging as compared to mature chickens. In contrast to this result Meseret (2010) reported that supplementary feed materials are offered indiscriminately to all classes of chicken on bare ground. This result is in line with that of Leulseged (1998) who reported severe scarcity of scavenging feed resource during wet seasons indicating that availability of scavenging feed resource basis depends on seasons and backyard conditions.

Table 3. Practice of feed supplementation for scavenging chickens in the study area (%)

Responses	Bate (n=40)	Tinike (n=40)	Adele (n=40)	Overall (n=120)
Extra feed supplementation (%)				
Yes	42.5	27.5	32.5	34.17
No	57.5	72.5	67.5	65.83
Maize grain (%)				
Yes	67.5	87.5	60	71.67
No	32.5	12.5	40	28.33
Foods left over (%)				
Yes	100	100	100	100
No	0	0	0	0
Kitchen wastes (%)				
Yes	100	100	100	100

Disease and predators

The traditional poultry disease control method practiced in the study area is shown in Table 5. Disease prevention measures practiced differs from place to place. About 60% of the overall respondents in the study areas reported to practice treatments of sick birds with traditional medicine and 90.83% dispose their dead birds by throwing away to dogs.

Table 5. Recorded highest mortality and methods of disposal of dead birds (%)

Parameters	Bate	Tinike	Adele	Overall
Most affected classes				
Chicks	95	90	90	91.67
All classes	5	10	10	8.33
Methods of disposing dead birds				
throwing away to dogs	92.5	87.5	92.5	90.83
Burying	7.5	12.5	7.5	9.17

According to the result of this study, losses of chicks attributed to predation are significantly high (Table 5). The most common predators reported to occur in the study area include wild cat (local name Adala), hawk (birds of prey), domestic cat, rats, and dogs. All of the respondents reported to have used their own means of protecting chickens from predators.

Breeding

The traditional poultry production system is characterized by lack of systematic breeding program. According to Table 6, poor productivity and sickness are the two major factors of culling chickens from the flock in the study areas. The majority of the respondents (81.67%) practice culling. About 5.83 and 94.17% of the respondents cull chickens from the flock for consumption and sale purpose respectively. Poor productivity, old age and sickness accounts for about 27.5, 17.5 and 55% of culling chickens from the flock in the study area, respectively. This study was in agreement with report of Mammo (2006) who reported that culling of unproductive chickens through consumption and sale.

Table 61. Reason and methods for culling chickens in the study area (%)

Parameters	Bate	Tinike	Adele	Overall
Culling Practice				
Yes	92.5	85	67.5	81.67
No	7.5	15	37.5	18.33
Ways of Culling				
By selling	95	100	87.5	94.17
By Consuming at Home	5	0	12.5	5.83
Factors to determine Culling				
Poor productivity	25	42.5	15	27.5
Old age	12.5	17.5	22.5	17.5
Sickness	62.5	40	62.5	55

Marketing of chicken and eggs

There is no formal poultry and poultry product marketing channel in the study areas and informal marketing of live birds and eggs involving open markets are common throughout the Woreda. The farmers directly sell their chicken to consumers and/or to small retail traders who take them to large urban centers. Live chickens and eggs are sold either at the farm gate, small village market (primary market) or at larger Woreda market (Secondary market in the town). The results of this study clearly showed that both eggs and chickens pass through different individuals before reaching consumer. About 78.33% of all the respondents reported to sale their poultry and poultry products in the Woreda market (secondary market) during market days. The remaining 21.67% of the respondents sold poultry and poultry products within their Kebeles (primary market) during market days. This situation warrants the existence of market constraints and access to market in the study area is determined by distance. Improving access to market information, development of better infrastructure and organization of poultry producers into market cooperatives are some of the recommendations aimed at correcting market deficiencies in rural Ethiopia (Aklilu, 2007)

Table 7. Determinants of chickens market price and marketing of chickens in the study area (%)

Criteria	Bate	Tinike	Adele	Overall
Pricing Criteria				
Plumage Color	12.5	5	12.5	10
Body Weight	75	87.5	62.5	75
Breeds	12.5	7.5	25	15
Beak Length	-	-	-	-
Ways of Marketing				
Main Market	87.5	62.5	75	78.33
Within the Kebeles	12.5	27.5	25	21.67
Means of transportation				
Carrying by hand themselves	100	100	100	100
Using pack animals	0	0	0	0

About 100% of the entire respondent carries their chickens to market places either on foot or using public transportations causing physical injury and other complications on the chickens which in turn reduce the quality of the products. The results of this study are in agreement with that of Solomon (2008) who reported that indigenous birds and eggs are transported over longer distances to supply town market which results in quality deterioration. Limitation in land holding, predominance of poultry disease and predations and extremely low family income are the major determinants of the purchasing power of the farming population. Young pullets are less priced than the counterpart cockerels. Cockerels with good feather colors had been priced higher for the reason of socio religious commitments.

Table 8. Market price of chickens and eggs in the study area (in Birr)

Market Price (Birr)	Bate	Tinike	Adele	Overall
Indigenous				
Pullets	37.5	30.5	35.5	34.5
Hens	62.5	65.5	69.5	65.83
Cocks	75	72.5	82.25	76.58
Cockerels	39.5	31.5	40.25	37.08
Eggs	2.35	2.45	2.25	2.35

Problems of Chicken Production in the Study Area

Major constraints of chicken production in the study area are presented in Table 9. About 52.7% of all the respondents ranked

disease as the most important constraint to rural poultry production in the study areas. The remaining respondents mentioned marketing and market related economic problem as the major problem to poultry production in the study areas. The results of this study is in line with that of Tesfu (2006) who ranked predation and disease conditions as the major problem of chicken production in Ethiopia.

About 70% of the respondents reported that disease and predations account for the largest annual poultry losses in Ethiopia. The predators involved in chicken losses include eagles, hawk, and crown, rats, wildcats, monkey and dogs while ants and mosquitoes are the insect pest that kills chicks especially in rainy season. On top of these there is lack of vaccination program and knowledge about the causes and transmission of disease.

Table 9. Constraints of poultry production in the study area (%)

Constraints	Bate	Tinike	Adele	Overall
Disease	52.5	45.5	60	52.67
Predators	27.5	37.5	12.5	25.83
Economic problems	12.5	7.5	15	11.67
Marketing	7.5	9.5	12.5	9.83

IV. CONCLUSIONS

In the study area all farmers share family dwellings with poultry, attributed to the small flock size, low priority given to chicken and relatively high cost of poultry house construction. Sharing family dwellings particularly during night times might also be associated with protection from predators. Limitation in land holding, predominance of poultry disease and predations and extremely low family income are the major determinants of the purchasing power of the farming population. Almost all the respondents reported poultry and poultry product market price fluctuation attributed to limitation in land holding, disease occurrence and low purchasing power of the consumers. The use of hay box brooder was found to be effective in reduction of mortality and releasing the broody hen to go back to laying. Popularization of the technology within the farming population including the provision of constructional and operational manual in local language seems to be desirable. Provision of basic education on market oriented small scale poultry production and management should be given through the existing extension system with special emphasis placed on women. The existing poultry extension package also need to place special emphasis on important veterinary issues, since poultry diseases are widely spread in the Woreda.

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