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Rural Chicken Production and Management in the Jimma Zone of South-West Ethiopia: A Case Study of the Dedo District

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Abstract

The goal of the research was to provide a profile of chicken farming and production in the Dedo district in the Jimma zone in southwest Ethiopia. Poultry population and accessibility informed the deliberate selection of three agro-ecologies within the district: highlands, midlands, and lowlands. For each of the three agro-ecologies, two peasant associations (PA) and thirty homes were chosen using a stratified probability random selection approach. In order to gather all the necessary data for the research, a sample size of 180 homes (6x30) was used. The majority of the chickens in the research region, about 96.1%, are non-descriptive indigenous breeds from Ethiopia. Cross breeds account for 3.9% and exotic breeds for 0.6% of the total. Despite the importance of village chicken production to livestock production in the study area, the chickens are often mismanaged due to issues like inadequate feeding, poor housing, outdated breeding methods, and lack of health care. As a result, the producers may not reap the benefits of their production. There is a great need to enhance the chicken and egg industry in the study region by introducing new health initiatives, enhancing extension services, establishing credit schemes, and creating more training possibilities. We strongly recommend more research on the study area's indigenous chicken-based village poultry, specifically focusing on its limitations and possibilities.

Keywords: the Ethiopian region of Dedo, poultry farming in rural areas

Introduction

Estimates put the overall number of chickens in Ethiopia at about 56.53 million. Chicks make up 41.35 percent of the country's poultry, with laying hens making up 32.18 percent. The estimated numbers of cocks, cockerels, and pulselets are 3.11 million, 5.32 million, and 5.85 million, respectively. According to the CSA (2017), the percentage of indigenous poultry was 94.31%, hybrid poultry was 3.21%, and exotic poultry was 2.49% of the total. A traditional poultry production method is used to raise indigenous chickens in Ethiopia. This system is defined by not feeding the birds with a specific purpose, keeping the chickens in small flocks, and having minimal input and output. on a recurring basis, the flock is devastated by sickness. According to the Ethiopian Statistical Authority (1985–1996), the average percentage of young chicks that make it to three months of age when raised in an environment with natural brooding is about 40%. Village poultry husbandry has grown more difficult owing to the high incidence of predators and the periodic and repeated outbreaks of chicken illnesses (Hoyle, 1992). No sufficient data on the study area's village chickens' production performance, production characterization, or husbandry practices exist, despite the fact that the Ethiopian government's development initiatives of village poultry have historically and currently prioritized genetic improvement via the introduction of exotic chicken breeds and the establishment of a national poultry extension package. Without familiarity with village chicken production and

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management systems, it is difficult to create and execute development projects centered on chickens that are beneficial to rural people. So, it's critical to learn about the husbandry techniques and chicken production in the Dedo District in Jimma Zone, Southwest Ethiopia. The present village chicken production system in the study region was characterized, and the husbandry methods of village chicken production were analyzed, as a result. Hence, these aims motivated the research to be undertaken.

Materials and Methods

Description of the study area

The study was conducted in Dedo district of Jimma Zone of Oromia Regional State, located at 18 km South of Jimma town and comprises of a total area of 1459.1 Km^2. Dedo distinct is bordered on the south by the Gojeb river which separates it from the SNNP Region, on the west by Gera, on the north by Kersa, and on the east by Omo Nada. Topographically, Dedo district is mountainous with an altitude ranging between 880 and 2400 m.a.s.l. Agro-ecologically, it consists of 18% highlands, 48% midlands and 34% lowlands. The poultry and human population of the district is estimated at 0.056 and 0.29 million, respectively (National Census, 2007). The farming practices are characterized by crop - livestock mixed system. Cereal grains are the major food crops cultivated whereas; livestock, chat and coffee are the major cash crops of the district.

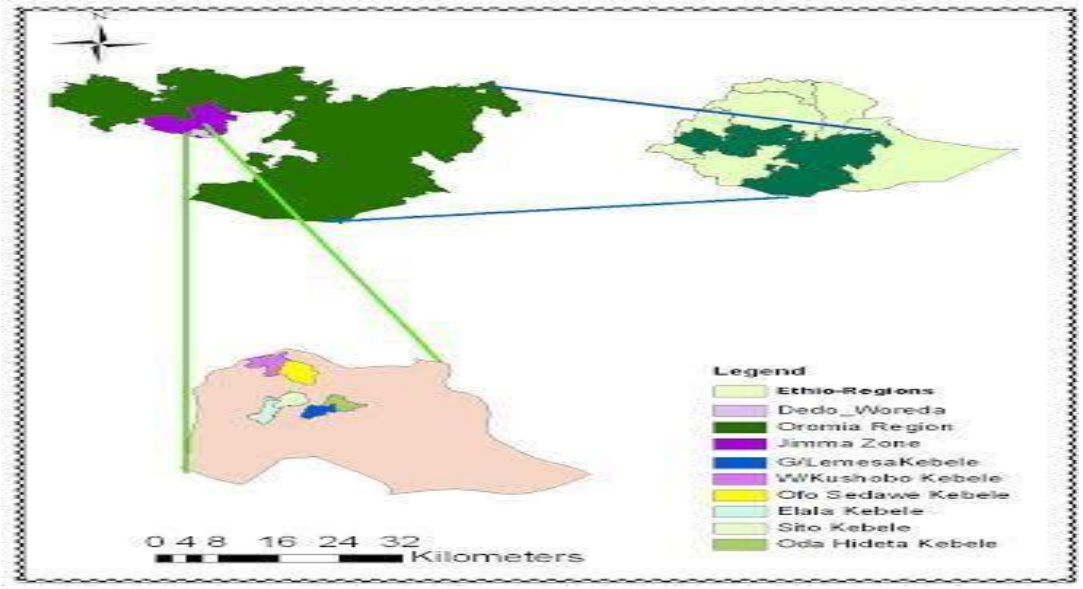

Figure 1: Map of Dedo district with selected PA

Selections of the Participating Households

Three different agro- ecologies (highland, mid-altitude and lowland) of the district were purposively selected based on their poultry population and accessibility as shown in Table1. Stratified probability random sampling (purposive and random) method was followed to select two peasant associations (PA) from each agro-ecology and a total of 30 households were randomly selected from each of the Peasant Association. Thus a total of 180

(6x30) households were used to carry out the study on characterization of village chicken production and husbandry practiced in the study area.

International journal of agricultural sciences and veterinary medicine

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Vol-3 Issue-01 Mar 2014

Table 1: Sampling frame of households in each Kebele

Poultry Population	PA	Number of HH	Agro ecology
4652	Sito Ofole	30 30	Midland
1053	Waro Kolobo Odo Hideta	30 30	Highland
609	Elala Garema Lamesa	30 30	Lowland
Total		**180**	

PA- Peasant association HH- House holds

Data Collection

Structured questionnaire was used to collect data from primary source which mainly included households, development agents and key informants followed by review of the available secondary data source. A field visit to oversee the overall husbandry practices and open discussion with poultry farmers were also made. Finally data on poultry population, management practices and characterization were collected using the questionnaires prepared to collect the data.

Statistical Analysis

All the data collected were analyzed using statistical package for social science (SPSS) version 21. The data was analyzed by using descriptive statistics i.e. mean, frequency and percentage and presented in the form of table and graphs.

Results and Discussion

Socio- Economic Characteristics of the Respondents

The results obtained from the study indicated that about 91% of the respondents were male headed households and the left were females, and all the respondents reported to have fully involved in farming activities as means of supporting their livelihood. The overall average land holding of the respondents was reported to be about 1.72 h/HH**.** The mean family size in the study area was calculated to be 7.1 persons/ HH (Table 2).

Table 2: Land holding, Family Size and Flock Size of the Respondent (Mean ±SD).

Variables	NHH	Highland	Midland	Lowland	Overall Mean
Land holding(ha/hh)	60	1.54±1.3	2.21±1.1	1.40±.60	1.72±1.1
Family size (persons/hh)	60	6.8±1.8	7.1±1.9	7.3±2.2	7.13±1.9
Flock size (chickens/hh)	60	10.5±2.6	11.72±5.1	10.47±3.9	10.91±4.0

NHH-Number of House Hold **SD**-Standard deviation

International journal of agricultural sciences and veterinary medicine

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Vol-3 Issue-01 Mar 2014

The overall mean age of the respondents was found to be about 42 years. About 23% of the respondents reported to be within the age group of 30- 60 years; whereas, about 34.4% of the respondents reported to belong

to the age group of 15-30years .Thus the results of this study showed that the majority of the respondents are in the economically active age group.

Regarding experience in poultry rearing, about 66 % of the respondents reported to have more than 15 years of experience in poultry rearing. According to the respondents farmers in midland agro ecology (38%) had longer experience in rearing poultry as compared to the respondents of highland and lowland agro- ecologies. Literacy wise, the results of this study also showed that about 25% of the respondents were illiterate. About 25.6 %, 23.9%, 19.4% and 6.1% of the literate respondents were reported to have gone through primary first cycle (1-4), primary second cycle (5-8), high school (9-10) and above secondary high school as shown in Figure 2. Educational back ground of the respondent was a major opportunity for village chicken production in the study area, so should reduce these challenges to exotic chicken production and management of village productivity.

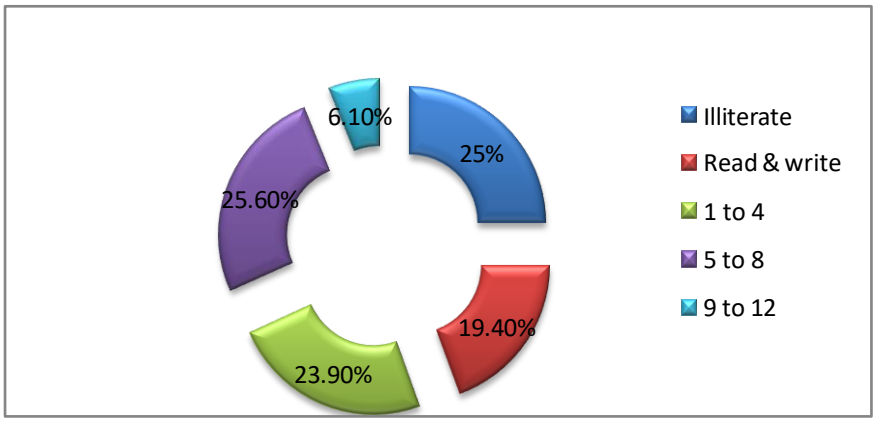

Figure 2: Profile and educational level of the respondents

Flock Size and Structure

Flock structure is described in terms of the number and proportion of the different age groups and sex in a flock. The plumage colors of the local chicken found in Dedo district are mixed (black, white, red, grey *etc*.). The flock size and structure of chickens and the mean number of chicken/HH in each agro-ecology are shown in Table 3. The flock size range between 2 and 12, 5 and 30 and 2 and 22 chicken/HH in the lowland, midland and highland, respectively (Table3). Mean flock size of 10.5, 11.72 and 10.47 chickens/HH was calculated for the highland, midland and lowland agro ecologies, respectively. The overall mean flock size 10.91 chicken/hh was recorded from the study area; the value of which is higher than that of the flock size of Oromia Regional state (3.6) and the national average (4.1) as reported by CSA (2017).

Table 3 : Flock Size and Structure of Chickens in the Study Sites

Item	High Land	PV	Mid-Altitude	PV	Lowlands	PV
Mean number of chicks (0-8wks) /hh	2.81±0.80	0.00	3.30±0.91	0.00	2.41±0.70	0.9
Mean number of Pullets (8-20wks) /hh	2.60±0.68	0.27	2.86±0.74	0.27	2.0±0.68	0.01
Mean number of cockerels (8-20 wks) /hh	1.5±0.49	0.00	1.60±0.64	0.00	1.40±0.42	0.24
Mean number of adult cocks (>20wks) /hh	1.10±0.60	0.62	1.10±0.64	0.62	2.05±0.50	0.74
Mean number of laying hens (> 20wks) /hh	2.5±0.52	0.28	2.2±0.67	0.28	2.13±0.52	0.41

International Journal of agricultural sciences and veterinary medicine

ISSN: 2320-3730

Vol-3 Issue-01 Mar 2014

Breeds and Breeding

About 96.1% of the chicken found in the study area belongs to the Ethiopian non-descriptive indigenous breeds of chickens. The remaining 3.9% and 0.6% are cross and exotic breeds, respectively (Table 4). The result of this study seems to follow the general national tendency in terms of breed, since it had been reported that about 94.31, 3.21 and 2.49% of the total national poultry population are reported to be indigenous, hybrid and exotic, respectively (CSA, 2017).

Table 4: Distribution of chicken breeds in the study area

Chickens breeds	Frequency (No)	Percent (%)
Indigenous	172	96.1
Exotic	1	0.6
Cross	7	3.9

About 97.8 % of the respondents reported to incubate eggs using mature broody hen (2nd and 3rd clutch) during the dry seasons after a careful selection of thoroughly broody hen based on their own selection parameters. About 56.1% of the respondents reported to select the broody hen on the basis of its previous hatching history. About 24.4, 9.4 and 4, 4% of the respondents select broody hen to be used for incubation on the basis of body size, plumage cover and the appearance of the broodiness. The remaining 5.7% reported to have used no selection criteria. About 97.8% of the respondents reported to have placed the incubation boxes in a protected and dark corner of the family dwellings with the use of cereal straws as bedding materials either on clay pot or on bare ground.

About 87.8% of the respondents do not mind for egg incubation position. The majority of the respondent (99%) incubates home laid eggs. About 80.4 % of the respondents reported not to practice any special management of the broody hen during incubation such as putting feed and water near to the brooding nest and avoiding disturbance. According to the results of this study, chickens are acquired through purchase from the local market (85%), purchase from agricultural office (10 %) (Some farmers keep the exotic Rhode Island Red (RIR and WLH) breed and as a gift and/or exchange (5%). According to Fisseha *et al. (*2010), the majority of the replacement stock (76–87%) originates from the household flock and the rest are purchased from the local market. Some farmers keep the Rhode Island Red breed of chickens distributed through the government extension system. These have been crossed with indigenous chickens in some instances. The non-monetary (gift) method of acquiring chicken represents one of the most important socio-cultural roles of chicken in Dedo district. Relatively better economic gains might be appreciated from chicken if the proportion of gifts and slaughtering of chickens for guests are reduced and positive response on management is provided (Table 5).

Table 5: The determinant factors of culling chicken in the Dedo Woreda

Causes of culling	**Frequency**	**Percent**
Poor productivity	28	15.6
Sickness	28	15.6
Old age	22	12.2
Frequency of broodiness	84	46.7
All	18	9.9

Village Chicken Husbandry Practice

Feeds and Feeding

International journal of agricultural sciences and veterinary medicine

ISSN: 2320-3730

Vol-3 Issue-01 Mar 2014

The major supplementary feed in the surveyed area comprise of cereal grains (88.3%) which include maize, sorghum, teff, barley, mixture of maize and sorghum, mixture of maize and wheat and mixture of maize and barley (Table 6). The remaining 11.7% supplementary feed materials consisted of household leftovers such as sugar beet, "*Kocho"* (Baked Enset), and "*Amicho*" (cooked and non-cooked enset). About 92.2 % of the respondents indicated that supplementary feeding were highly required during the big (June to August) and small rainy (March to May) seasons than during the dry season (September to February) mainly attributed to the shortage of grain during the rainy season. In most cases, provision of feeds to chicken was seasonal as reported by Fisseha *et al.* (2010) from a survey conducted on indigenous chicken productions and marketing systems of Bure and Fogera of the Amhara regional state and Dale Woreda of the SNNP regional state.

According to respondents' report supplementations are aimed at improving health status and overall productivity of their chickens and young chicks are given priority in supplementary feeding because of the fact that the young chicks could not adequately scavenge and might be attacked by predators. Laying hens are given the second priority in terms of supplementary feeding aimed at increasing egg productivity. The results of this study showed that the respondent practiced supplementary feeding of their chicken, which is usually offered in the morning (18.3 %), in the afternoon (2.2 %), in the afternoon and evening (1.1 %), in the morning and afternoon (51.7 %). About 26.7 % the respondents reported to have provided supplementary feed more than twice per day (Table 6). This result implied that although the supplementary feed is not satisfactory in terms of quality and quantity. The majority of the respondents (82.8 %) provide supplementary feed by throwing on bare ground to feed in groups without age separation, while 9.4 % reported to have provided in a feeder. The remaining 7.8 % of the respondents provide the supplementary feed either in a feeder or on bare ground.

Table 6: Chickens Feeding Practice of Dedo Woreda

Feeding Practices		**Frequency**	**Percentage**
Nutrient source	Scavenging	179	99.4
	Purposeful feeding	1	0.6
Source of feeding	From the house	163	90.6
	Purchased	17	9.4
Feeding practice	In a feeder	17	9.4
	On bare ground	149	82.8
	Both	14	7.8
Way of supplementation	Separate feeding of different classes of chickens	80	44.4
	Collective group feeding	100	55.6
Time of supplementation	In the morning	33	18.3
	In the afternoon	4	2.2

International journal of agricultural sciences and veterinary medicine

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Vol-3 Issue-01 Mar 2014

	In the afternoon and evening	2	1.1
	In the morning and afternoon	93	51.7
	In the morning, afternoon and evening	48	26.7
Type of feed supplemented	Grains	159	88.3
	Others	21	11.7
Types of grains supplemented by chicken	Wheat	5	2.7
	Maize	110	61.5
	Sorghum	34	12.4
	Barely	3	1.6
	Maize and sorghum	20	11.1
	Maize and wheat	3	1.6
	Maize and barley	2	1
	Teff	3	1.6

Provision of Water

According to the results of the study there were seasonal variations in the source and practice of offering water for village chickens in the study area. About 56% and 44% of the respondents reported to offer water to their chickens throughout the year and during the dry period, respectively. About 71.19, and 10% of the respondents reported to have offered river water, spring water, both rain and river water to their chicken, respectively. The result of this study was in agreement with that of Fisseha *et al*. (2010) who reported that, the major sources of water for chicken in the Bure Woreda of the Amhara regional state is river (30.4%), spring (28.5%), locally made underground water (21.4%) and pipe water (19.7%).

The overuse of river water during the dry period is reported to have become heavily contaminated with disease causing pathogenic organisms. The contamination seems to be severing since the same river water could be used for human and wild life consumption as reported by the respondents of the current study. Birds of any age can be affected, although young ones are more susceptible. The result of this study also showed that about 78.3% of respondents reported to have regular watering troughs made up of plastic material. About 7.2%, 0.6%,

4.4 and 0.6% of the respondents reported to have used watering through made up of metal, wood and broken pot and stone, respectively. About 8.9% of the respondents use any locally available materials as watering trough. About 26.7% of the respondents clean the watering through once a day, while 57.8 % and 10.6% reported to have cleaned twice per day and three times a day respectively. The remaining 4.9 % never clean watering troughs. Unclean watering troughs are one of the major sources of contamination of the drinking water by pathogenic disease causing organisms in Dedo district.

Housing

Out of the total respondents, about 70.6% of the respondents provided separate house for their poultry during night times. And the remaining, 29.4% of the respondents keep

International journal of agricultural sciences and veterinary medicine

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Vol-3 Issue-01 Mar 2014

their chicken in family dwelling together with human being during night times.

About 88.3 % of the respondents strongly believe that there are significant advantages of constructing separate poultry house and the remaining 11.7% seems to be in-different pertaining the advantages and purpose of separate poultry houses. The problem of separate chicken house construction in the study area was reported to be lack of knowledge about feeds and feeding practice (86.1%), shortage of construction material (9.4%) and disease prevalence (2.2).

Table 7: Housing system of the study area

Village chicken housing system	Frequency	Percent
In the kitchen	20	11.1
Perches' on trees	24	13.3
Homemade cage	2	1.1
Perch inside the house	9	5.01
Family dwelling	101	56.1
Dwelling other livestock	24	13.3
Cleaning shelter		
Once per day	159	88.3
Every two to three day	21	11.7
Per week	0	0
Never clean	0	0

The majority of the respondents in the study area reported to have used different materials in the construction of poultry house. About 5.6, 66.1, 23.9, 4.4 % of the respondents reported to have used mad blocks, iron sheet, wood and grass as poultry house construction materials respectively.

Diseases Conditions and Health Care

According to the results of this study, there are several poultry diseases characterized by seasonal outbreaks in the study area. Based on the observations of the respondents, serious outbreak usually occurs during the rainy seasons. About 45, 23.3, 15, 12.8, 2.6 and 1.1% of the respondents indicated that Coccidiosis, Cholera, Infectious bronchitis, Newcastle disease, Fowl pox and External parasite as economically important poultry disease in the study area

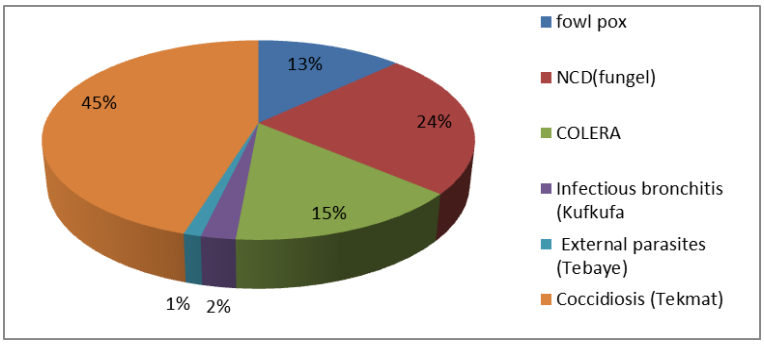

Figure 3: Proportion of Common poultry disease of Dedo district as reported by the respondents.

ISSN: 2320-3730

Vol-3 Issue-01 Mar 2014

According to the results of the present study, 55% of the respondents revealed that farmers usually treat sick chickens using traditional medicine. They use garlic, tobacco leaf, local alcohol, pepper powder, butter, lemon, orange, "*Feto*" (Lipdum sativum) seed powder, "*Endod*" (Phytolacca dodecandra) leaf juice and onion *etc*. as soaking, nasal use and smoking against external parasite.

However, about 13% of the respondents are reported to consult veterinarians when their chickens get sick, even if there is no adequate and efficient veterinary and extension service in the study area. About 84.6 and 10% of the respondents reported lack of awareness about the availability of vaccines, lack of attention to village chicken and inaccessibility and shortage of vaccines as the major health problems of in the study area.

Conclusion and Recommendation

Village Chicken production, which is mainly depends on non-descriptive indigenous breeds is an essential part of livestock production system in the study area. However, there is a poor management practices such as poor feeding, improper housing, unimproved breeding methods and meager health care has been given for the chicken, so that the producers might be benefited from the production. Since there is available high demand towards chicken and eggs in the study area, the sector should be improved through provision of appropriate intervention in health care, provision of better extension service, credit schemes and training opportunities. Further investigation into the constraints and potential of indigenous chicken based village poultry in the study area is highly encouraged.

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