

**CHARACTERIZATION OF NATIVE FREE RANGING
CHICKEN REARING SYSTEM IN RURAL
SETTINGS OF RAJSHAHI**

A THESIS

BY

MD. JAFAR EQBAL

REGISTRATION NO. 1305086

SEMESTER: JANUARY-JUNE , 2014

SESSION: 2013-14

MASTER OF SCIENCE (M.S.)

IN

POULTRY SCIENCE



**DEPARTMENT OF DAIRY AND POULTRY SCIENCE
HAJEE MOHAMMED DANESH SCIENCE AND TECHNOLOGY
UNIVERSITY, DINAJPUR**

JUNE 2014

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Submitted to the Department of Dairy and Poultry Science
Hajee Mohammad Danesh Science and Technology University, Dinajpur
in partial fulfillment of the requirements
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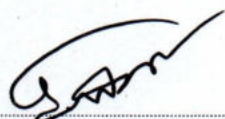
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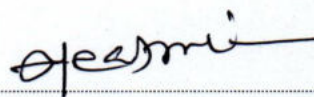
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**HAJEE MOHAMMED DANESH SCIENCE AND TECHNOLOGY
UNIVERSITY, DINAJPUR**

JUNE 2014

DEDICATED
TO MY
BELOVED PARENTS

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ABSTRACT

An exploratory research was carried out at farmer's households based on household survey using a variety of data collection methods/tools (semi-structured interview, focus group discussion and direct observation) to better understand the ground situation of smallholder family poultry (FP) rearing system in the rural settings in Bangladesh. Total n=97 poultry keeping households were purposively selected for household survey intended to gain detailed information on flock composition and other related issues to backyard poultry rearing practices. In this study it was found that about 77% of the village family rear poultry with an average around 6 per holding. Self consumption (85%) is the apex use of FP rearing along with little amount for sell and hobby. There was no training and access to credit facility. It was found that majority of the households share the same house for night shelter of chicken with other poultry and livestock species and even with their own house. Mud was the principal material for building poultry house with bamboo and wood, in a very few cases concrete made house was observed. Only 13% of the households provided nest box for hens and option for ventilation in the poultry houses was totally absent. The major feed sources for chickens were household wastages, earthworms, insects, seeds, green leaves and other plant materials through scavenging with little supplementation of broken rice, rice husk, paddy, wheat, maize crust. It was observed that the sources of drinking water for FP are tube-well canal that villagers used for bathing and washing utensils and clothes, pond, drain, sewerage, and any water logging. The degree of vaccination to the FP was very low (6.26%) or negligible. only 4% of the household received service for their poultry from veterinary surgeon. Poultry keepers mostly used bamboo made broom (85%) for cleaning the poultry house, and never used the chemical disinfectant for cleaning the shed. The study also disclose that the poultry keepers have very limited idea about the transmission of diseases from birds to them, the summation of not harmful and no idea comprise more than 85% of the respondents . It clearly indicates that the rural FP rearers are in high chance to be infected with inter-communicable poultry diseases like avian influenza.

Key words: Family poultry, Free range, Households, Poultry keepers

LIST OF CONTENTS

CHAPTER	TITLE	PAGE
	ACKNOWLEDGEMENTS	iv
	ABSTRACT	vi
	LIST OF CONTENTS	vii
	LIST OF TABLES	xi
	LIST OF FIGURES	x
	ABBREVIATIONS	xii
CHAPTER 1	INTRODUCTION	1-2
CHAPTER 2	LITERATURE REVIEW	3-5
CHAPTER 3	METHODOLOGY	6-8
	3.1 Time frame work and site of the study	6
	3.2 Sampling and Sample size	6
	3.3 Census survey	6
	3.4 Household survey	6
	3.5 Data Collection methods	7
	3.6 Semi-structured interview (SSI)	7
	3.7 Focus group discussion (FGD)	7
	3.8 Direct observation	8
	3.9 Data Analysis	8
CHAPTER 4	RESULTS AND DISCUSSIONS	9-38
	4.1 Population, Purpose of rearing and utilization pattern of FP	9
	4.2 Provision of credit supply and training facilities to FP production	13

LIST OF CONTENTS (Contd)

CHAPTER	TITLE	PAGE
	4.3 Person in the family responsible for taking care of birds and ownership pattern of FP	14
	4.4 Situation, materials used, provision of ventilation and nest box to FP housing	17
	4.5 Feed resources, feeding, and water supply to the birds	20
	4.6 Hatching, criteria and source of replacement for FP	23
	4.7 Ground situation of veterinary input services to the FP	26
	4.8 Existing practice of Lice, Mite and Pox treatment in FP by the villagers	31
	4.9 Health and sanitation related activities to FP by the villagers	33
CHAPTER 5	SUMMARY AND CONCLUSION	39-41
	REFERENCES	42-52
	QUESTIONNAIRE OF THESIS	53-60

LIST OF TABLES

TABLE	TITLE	PAGE
Table 1	Population, purpose of rearing and utilization pattern of FP	9
Table 2	Livestock and poultry immunization within one year	26
Table 3	Availability of poultry vaccines in Local DLS Offices	27

LIST OF FIGURES

FIGURE	TITLE	PAGE
Figure 1	Flock size of birds	10
Figure 2	Duration of FP rearing	11
Figure 3	Purpose of FP rearing	11
Figure 4	Principal Utilization of meat and eggs	12
Figure 5	Credit to the FP production	13
Figure 6	Provision of training regarding FP rearing	14
Figure 7	Responsibility bearer for FP rearing	15
Figure 8	Ownership pattern of FP	16
Figure 9	Housing situation	17
Figure 10	FP sharing house with others	18
Figure 11	Housing materials	18
Figure 12	Provision of nest box for hen	19
Figure 13	Option for ventilation	20
Figure 14	Feed supply to FP	21
Figure 15	Water supply to FP	22
Figure 16	Hatching of FP eggs	23
Figure 17	Criteria for flock replacement	24
Figure 18	Showing the purchase pattern of the FP	25
Figure 19	Places from where villagers purchase poultry medicine	25
Figure 20	Reasons for not vaccinating birds	28
Figure 21	Sources of veterinary products used for Family Poultry	29
Figure 22	Most important losses of birds	30
Figure 23	Fate of sick birds in the household	32

LIST OF FIGURES

FIGURE	TITLE	PAGE
Figure 24	Birds position during shed cleaning	33
Figure 25	Shed cleaning tools	34
Figure 26	Shed cleaning frequencies	35
Figure 27	Disposal of poultry manure	35
Figure 28	Treatment of nest box with medicine	36
Figure 29	Disposal of dead birds	37
Figure 30	Perception of poultry keepers about impact of poultry disease on public health	38

ABBREVIATIONS

%	Percent
INFPD	International Network for Family Poultry Development
LIFDCs	low-income food-deficit countries
AI	Avian Influenza
H5N1	A subtype of the influenza A virus
BBS	Bangladesh Bureau of Statistics
Sp	Species
Sl	Serial number
HPAI	Highly pathogenic avian influenza
LRI	Livestock Research Institute
B2	Vitamin B2
TC	Tetracycline
ND	Newcastle Disease
VFA	Veterinary Field Assistant
ULO	Upazila Livestock Officer
VS	Veterinary Surgeon
MOFL	Ministry of Livestock and Fisheries
<i>et al</i>	Associates
DLS	Department of Livestock Services
FAO	Food and Agricultural Organization
NGO	Non Government Organization
BRAC	Bangladesh Rural Advancement Committee
FP	Family poultry
No	Number
g	Gram
i. e	that is
Fig	Figure
@	At the rate of



CHAPTER I

INTRODUCTION

CHAPTER I

INTRODUCTION

Bangladesh is the highest densely populated country in the world having over 150 million people with 1015 persons per square kilometer (BBS, 2011) with a high population growth rate; almost 75% people of the country live in rural areas. Over 80% of the rural households in Bangladesh rear poultry in small flock with an average of 6.8 per holding under scavenging system (Saleque, 2001). Village chickens are also known as rural, indigenous, scavenging, traditional or family chickens, and have various names in local languages. Poultry are widely acknowledged as the livestock of the poor, and poultry production is part of most smallholder farming systems. Guèye, (2002) mentioned that 85 % of rural households in South Asia keep chickens or other types of poultry. Family poultry (FP) are important and contribute income to poor farmers, especially women in low-income food-deficit countries Gueye, (2002). Village poultry can be found in all developing countries and play a vital role in many poor rural households Alders *et al.* (2004); Alexander *et al.* (2003); Copland and Alders (2005); Spradbrow, (1994). Landless families in Bangladesh form 20% of the population, and they keep between five to seven chicken per households (Fattah, 1999). In LIFDC countries, family poultry-produced meat and eggs are estimated to contribute 20 to 30 %of the total animal protein supply (Alam, 1997; Branckaert, 2000) taking second place to milk products (38%), which are mostly imported. It is widely accepted that village chickens are important in breaking the vicious cycle of poverty, malnutrition and disease (Roberts and Gunaratne, 1992). The household is the primary unit within the smallholder farming system, with age and gender determining the division of labor. A major issue of concern for this sector, which provides support to millions of rural households having highly vulnerable livelihood, have decline in population in recent years. According to the livestock census of 2003 and 2007, the number of backyard poultry birds declined from 238 million in 2003 to 153 million in 2007. In Bangladesh, although livestock reared by most of the rural people provide food security and sustainable livelihoods, but back yard poultry sector is not adequately paid attention. Livestock services to the rural livestock keepers are considered to be very poor, insufficient and infrequent; the majority of the people who deprived from these services are poor (Nasrin and Hafezur, 2003). Lack of

knowledge about scientific poultry rearing, poor management practices by the rural poultry keepers along with disease problems hindering FP production.

Family poultry may be defined as the birds comprised of local genetic stocks, reared in extensive system with minimal input and kept mainly for home consumption. The international network for family poultry development (INFPD) of FAO (1997) defined family poultry as birds of any genetic group (improved or unimproved), reared for family nutrition and income generation and labor is hired from family but the number of birds should not exceed 100.

Keeping poultry makes a substantial contribution to food security throughout the developing world. It helps diversify incomes and provides quality food, energy, fertilizer and a renewable asset in over 80% of rural households in Bangladesh (Alam, 1997; Saleque, 2001). Chicken meat and eggs are a source of high-quality nutrients (e.g. proteins and micronutrients) that are often otherwise unavailable to poor families. In a study by FAO (2005) reveals that chickens are often looked after by women and children and so programs that improve production will simultaneously improve the income and knowledge of these household members. Smallholders can produce chickens at little or no cost, which has a very significant competitive advantage over almost any other income-producing activities that they may choose. As such, the activity is essentially financially risk free. But the question remains: how, more specifically, do poultry contribute to the livelihoods and food security of the poor.

In this context, the objectives of the current study were:

- i. To know the FP status in the rural households.
- ii. To identify the actual housing, feeding and watering system of backyard FP.
- iii. To assess the actual situation of veterinary input services to the FP production in rural areas of Bangladesh.
- iv. To assess prevailing hygiene and sanitation practices to FP production in the rural communities.



CHAPTER II

LITERATURE REVIEW

CHAPTER II

LITERATURE REVIEW

Poultry include all domestic birds kept for the purpose of human food production (meat and eggs) such as chickens, turkeys, ducks, geese, ostrich, guinea fowl and doves and pigeons. FP production in Bangladesh usually synonymous with the production of chicken and ducks Haque *et al.* (1999). Guèye, (2002) mentioned that 85 percent of rural households in south Asia keep chickens or other types of poultry (FAO, 2003; Islam and Jabbar, 2005). Over 80% of the rural households in Bangladesh rear poultry in small flock with an average of 6.8 per holding under scavenging systems (Saleque, 2000). Gueye, (2002) mentioned the major constraints to backyard poultry enterprise are losses from mortality due to diseases and predators, as the birds are reared on traditional practices with no focus on veterinary and health services.

Due to the hardness of meat, organic in nature the market demand for the FP is so high; it is also a triggering factor for FP rearing as mentioned by Kumar *et al.* (2013); Barua and Hawlider (1999) indicate that lack of access to credit has been identified as a major mechanism with which a household can improve its economic condition. Ahmed *et al.*, (2000) mentioned that lack of basic training is a major constraint in FP development. In rural areas, housing occupies a low priority in the management of all poultry including chickens under extensive management system claimed by Das *et al.* (2008). In earlier the study of Saleque, (2000) and Khan *et al.* (2006) in Bangladesh mentioned that 87% ownership of native chicken is in the hand of female. Mapiye & Sibanda, (2005), Tadelle and Ogle *et al.* (2000) also reported that more than 90% ownership of indigenous poultry is in the hand of women.

Guèye, (2005) mentioned that the women take after 75% of the daily activities and also decision maker for the family poultry. The nutrients available to locally scavenging chickens are generally deficient; not only does their availability vary with the seasons of the year and the localities, as reported in studies Gunaratne *et al.* (1993), Tadelle and Ogle, (1996), Huque, (1999) and Mwalusanya *et al.* (2002). Native hens are one of the best broody chicken breeds Kumar *et al.* (2008). Farmer even considered that the birds have no need of water at night time when they are in enclosure as claimed by Nirranjan *et*

al. (2008). Rahman *et al.* (2007) mentioned that eggs can be used to produce more chicks, but once Newcastle disease is under control and chick husbandry is improved. Jahan *et al.* (2003) mentioned that price behavior of eggs in Bangladesh, are constrained with lack of permanent market place, and existing diseases which cause immediate loss. Hafez, (2001) reported that the agro-ecological and geo-climatic conditions of Bangladesh are highly favorable for growth and multiplication of helminthes. Parasitic infestation in free-range birds causing reduced growth and mortality but often neglected as stated in Muhairwa *et al.* (2007). Farjana *et al.* (2004) mentioned 96.99% positive cases of parasitic diseases of ducks in their study at Netrokona district in Bangladesh.

On an average 30% poultry die annually due to different diseases in Bangladesh by (Ahmed and Hamid, 1992). Guèye, (1999) reported that there are many plant products that rural farmers in developing countries believe to improve productivity or rather reduced the impact of diseases of their chickens.

In semi-scavenging and scavenging systems, birds remain constant contact with soil which serves as an important reservoir and transmission site for helminthes and insects Muhairwa *et al.* (2007) similar result was found by Ahmed, (1969) Baki and Mondal, (1998) who reported 66% and 65.3% helminthes infections in ducks and chicken respectively. Hussain *et al.* (1996) mentioned the overall prevalence of gastrointestinal helminthes were 63.41%. Gastro-intestinal and tape worm causes less mortality but cause severe depression in the growth and reproductive rate of the birds Hussain *et al.* (1996); Howlider *et al.*, 1991). Among the problems encountered, parasitism is thought to be the major causes of hindering the chicken production Nooruddin *et al.*, (2006). A number of researchers Bhuyan, (1970); Nooruddin *et al.*, (2006); Howlider *et al.* (1991) and Chowdhury *et al.*, (1985) in their study reported high prevalence of different helminthes parasites in birds. The prevalence of virulent strains (velogenic, viscerotropic and pneumotropic) in tropical countries; continuous contact with other domestic and wild species of birds (such as ducks and pigeons) and uncontrolled movement of birds between villages, which can carry the virus without showing the disease (Majiyagbe and Nwanta, 2008). There is a seasonal pattern to outbreaks of ND claimed by Sharma *et al.* (1986), influenced by the arrival of migratory birds; changes in climatic conditions leading to stress, which predisposes birds to the diseases. Keeping poultry inside the bedroom and being exposed to faeces, and to water bodies shared with ducks have been

suggested as potential risk exposures to avian influenza in human cases in Bangladesh by Sultana, *et al.* (2011). Avian influenza is a notifiable disease in FP as argued by Branckaert, (2007). According to literature, the disease depends on the age of the birds, species and the type of bird specific characteristics of the viral strains involved and the environmental factors stated by Mabbett, (2005).



CHAPTER III

METHODOLOGY

CHAPTER III

METHODOLOGY

The methodology used in this study is a combination of survey and a variety of data collection methods to better understand the situation of smallholder backyard family poultry (FP) keeping in the rural communities in Bangladesh. Detailed discussion about the techniques and data collection instruments and procedures is given in the subsections below:

3.1 Time Framework and Site of the Study

The study was carried out at farmer's households in Kapasia village at Charghat Upazilla (sub-district) of Rajshahi, Bangladesh in the duration of January-April/2014. The village is 10 kilometers away from the district town and well connected by means of road communication. The land topography of the studied village is plain land in nature similar to most of the villages in Bangladesh.

3.2 Sampling and Sample Size

All the households in the studied area (N= 126) were taken for a census survey, among them all poultry keeping households (n=97) were purposively selected for 'household survey' intended to gain detailed information on flock composition and other related issues to backyard poultry rearing practices in the rural communities. All poultry keeping households were included as sample size for the survey because of small in numbers.

3.3 Census Survey

A census survey was carried out for systematically acquiring general information on livestock and poultry population from all the households in the studied area.

3.4 Household Survey

Purpose of census survey was to recognize the poultry keeping households in the communities. With the information gathered in the preliminary census, a household

survey, in the selected families specially engaged with poultry keeping was carried out to gather information from households on a wide range of topics concerning poultry population, composition of flocks, housing, feeding, veterinary input services, and other management related issues.

3.5 Data collection methods

Generally survey research involves collection of data from natural settings where researcher concerned with participants belief, attitude, and behavior within the natural settings. In addition, it will also describe the instruments used to collect the information and will cover the methods chosen for data collection. In the current study, a number of data collection methods and tools were used in order to make the study reliable. The used methods are discussed below:

3.6 Semi-Structured Interview (SSI)

Semi structured interviews were conducted with a fairly open framework which allows focused, conversational, two way communication. Interview guideline was made on a sheet of paper which has taken during each interview. The purpose of interview, a number of general questions and sub questions to be discussed were written on the paper sheet. A possible priority list of questions was made to be interviewed and questions were designed in an open ended manner. Informants were at freedom to express their views in their terms. Answers were carefully listened and related questions were asked to obtain additional information. Notes were taken in written form during interviews.

3.7 Focus Group Discussion (FGD)

To conduct three focus group discussions, people from similar experiences and ages (men alone, women alone and young children alone) were brought together to discuss on specific topics related to rural FP production, under the guidance of a moderator. The purpose of FGDs was to get a better insight of current situation and practices of backyard poultry rearing. Each focus group was in size of 8-10 participants. Participants were recruited carefully to represent the target households and more homogenous group were formed to make participants comfortable and free to express their views and ideas during discussions. An outline of the discussion deciding all topics to be discussed, organized

into a logical format was carried out during each focus group discussion. The questions were general in nature and suggested probes were used to stimulate discussion and bring out details. The knowledge and views of the participants were respected. Each discussion was conducted by the guidance of a facilitator and notes were taken by a note taker during discussion.

3.8 Direct Observation

Direct observation technique was employed in getting information by noting down the things, which were seen happening at that time. Five direct observations were done to understand the actual situation on a wide range of issues related to poultry housing, feeding, source of feed and water, the general hygienic conditions etc. The findings from direct observation were useful to cross-check the verbal information obtained from semi-structured interviews and group discussions.

3.9 Data Analysis

Different methods were used to process the qualitative and quantitative data. Quantitative data were analyzed using descriptive statistics such as frequency, per cent distribution, mean, minimum and maximum values. Qualitative data were manually processed by listing the salient points, grouping the topics, culminating into themes and ending up to the objectives of the research. Secondary data on previous researches relating to the subjects were also used to gain in-depth analysis and therefore understanding of the findings.



CHAPTER IV

RESULT AND DISCUSSIONS

CHAPTER IV

RESULT AND DISCUSSIONS

4.1 Population, purpose of rearing and utilization pattern of FP

A total number of 126 households in the village was surveyed, among them 97 households were found keeping poultry either duck or chicken and the rest had other livestock assets.

Table1 shows that the average number of birds kept by the households was 6.23 and 77% of households rearing family poultry as the part of their daily activities.

Table1: Composition of poultry and other livestock species

Species	% Households keeping poultry	Minimal number	Highest number	Average number	Standard deviation
Chicken	77	1	23	5.10	3.87
Ducks	20	1	10	1.13	0.57
Poultry (chicken/ducks)	97	1	23	6.23	4.44
Goats	25	1	5	1.68	1.21
Sheep	4	1	4	0.10	0.04
Small ruminants (goats/sheep)	29	1	8	1.78	0.82

Saleque, (2007) in his study stated that over 80% of the rural householders in Bangladesh rear poultry in small flock with an average of 6.8 per holding under scavenging systems. This result is consistent with his findings. The number of poultry per holding in rural areas of Bangladesh was 5.33 in estimation of Agricultural census (2008). This result varies from our present situation. Beside chicken, duck rearing is also an important factor to the poultry keepers, they believe that the duck lays more eggs than chicken but it is not as popular as chicken due more prone to disease, and peoples believe that the water is compulsory for its rearing. Chicken and ducks in the studied area were non-descriptive

local and only a few numbers of crossbred chickens (Sonali, originated from the crossing between RIR male and Fayoumi female) were found in a small number of households.

In comparison with the findings of Saleque (2007), above Table 1 clearly indicates that the poultry keeping household percentage have decreased; this may be due to the socio economic condition of the people. Many people have changed their livelihood and engage themselves in other type of activities. High mortality of village poultry due to disease may be another cause of decreased number of poultry keepers in the communities. The reason for tendency of smaller flock size may be the socio-economic condition of the respondent who seems to be less dependent on backyard poultry as their livelihood. A larger chicken flock size is likely to cause problems in the traditional backyard system. The farmers always expect for greater flock size but due to disease, predation and malnutrition the numbers of birds are always decreasing. Infectious diseases might also spread easier and faster within a crowded chicken flock. Conditions related to poor husbandry or nutrition is also likely to be aggravated with an increasing number of chickens.

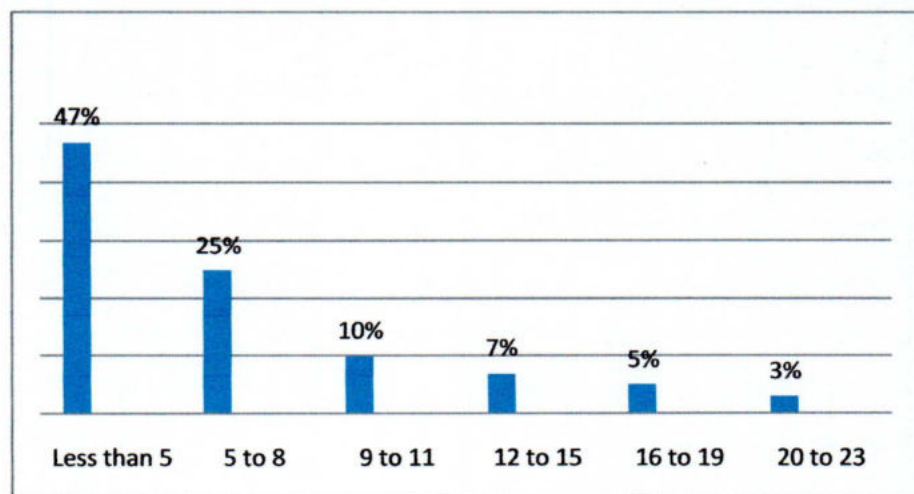


Figure 1: Flock size of the birds

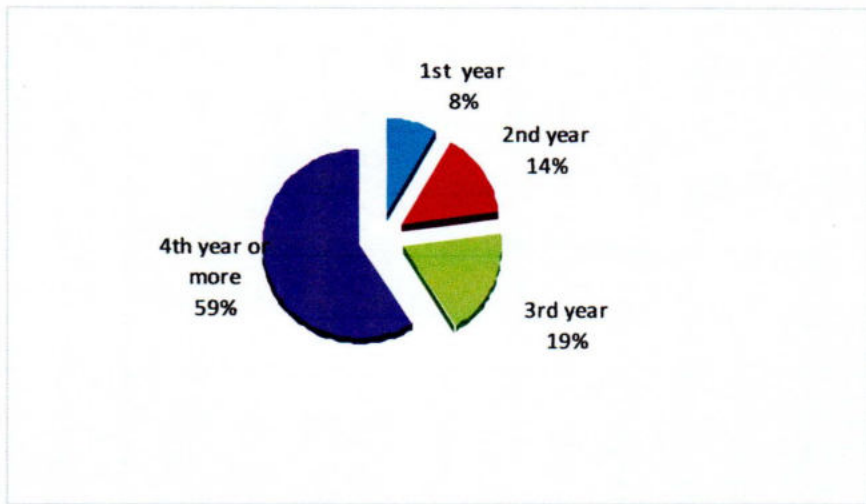


Figure 2: Duration of FP rearing

FP rearing is a common practice in rural Bangladesh, most of the household rear the birds for more years, and it will not be critics if one say they rear FP as their life time. During the childhood the children care the birds and after marriage they start a new life with new birds only the house changed but not the activities..

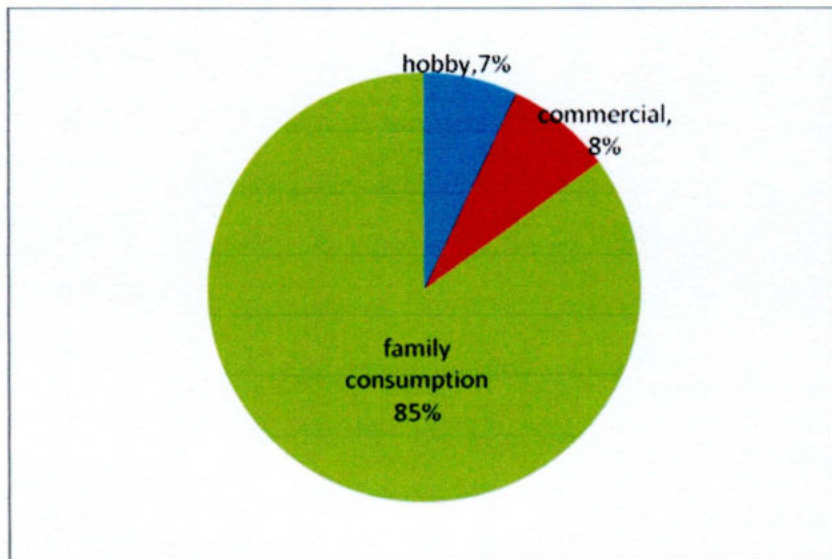


Figure 3: Purpose of FP rearing

From Figure 3 it is evident about 85% of the rural families rear poultry for home consumption only. The finding is also agreed with the result of Askov, (1999) who mentioned that family consumption and additionally small income generation is the purpose of more than 75% of family poultry rearing in Bangladesh. The respondent also think it as a stock for their rapid need to feast their intimate guest and relatives as required, when the broiler or other poultry is out of reach. Due to the hardness of meat and organic in nature the market demand for the FP is so high; which ultimately acts as a triggering factor for FP rearing. Some rear FP for fancy or hobby and others for commercial use. Though the FP keepers said that they rear FP commercially, in reality they sold live birds to meet up their family needs.

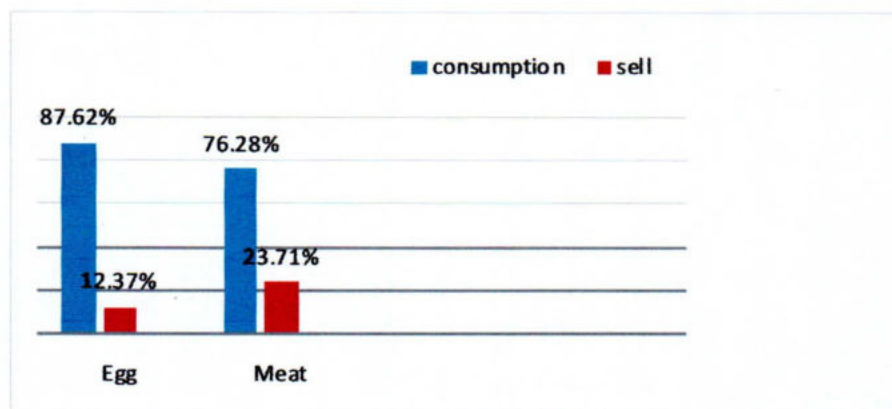


Fig 4: Utilization of meat and eggs

Eggs from FP are mostly used for hatching purpose to produce more chicks, the surplus eggs were usually used for family consumption and sell. The findings of the present study demonstrated that consumption of egg is more than sell. However the sell of meat was higher than that of egg which might be due to selling of birds for disease outbreak; meet the petty demand of money required for the maintenance of daily livelihood (Figure 4). A healthy and productive chicken flock may have the capacity to increase in numbers and allow the off-take of more birds for consumption, sale, barter and other purposes. The eggs are therefore a useful source of extra income and a very good source of nutrition for all members of the family.

4.2 Provision of credit supply and training facilities to FP production

No one of the poultry keepers has ever received the credit for their family poultry rearing (Fig. 5). Lack of access to credit has been identified as a major mechanism with which a household can improve its economic condition as stated by Barua and Howlider (1990).

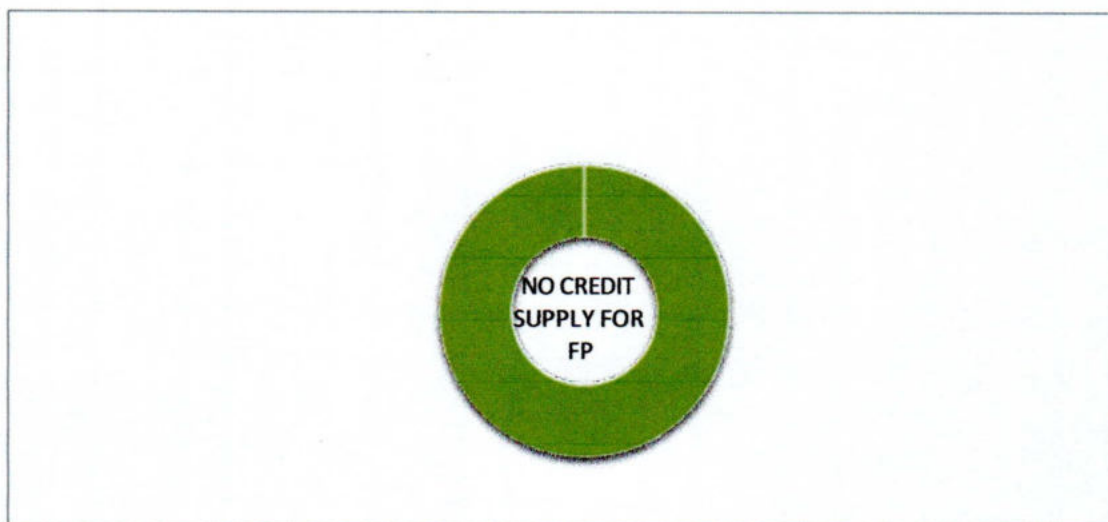


Figure 5: Credit facility to the FP production

Normally smallholder backyard poultry keepers have never received any credit from both government and non-government organization for their birds, the credit scheme is available for the commercial part and to some extent for large ruminant or cattle fattening as argued by Saleque, (2000). There is thus a dire need to assist particularly the poultry keepers in their efforts to earn an income and to the extent possible and to improve their long term potential for deriving income from sustainable backyard poultry production.

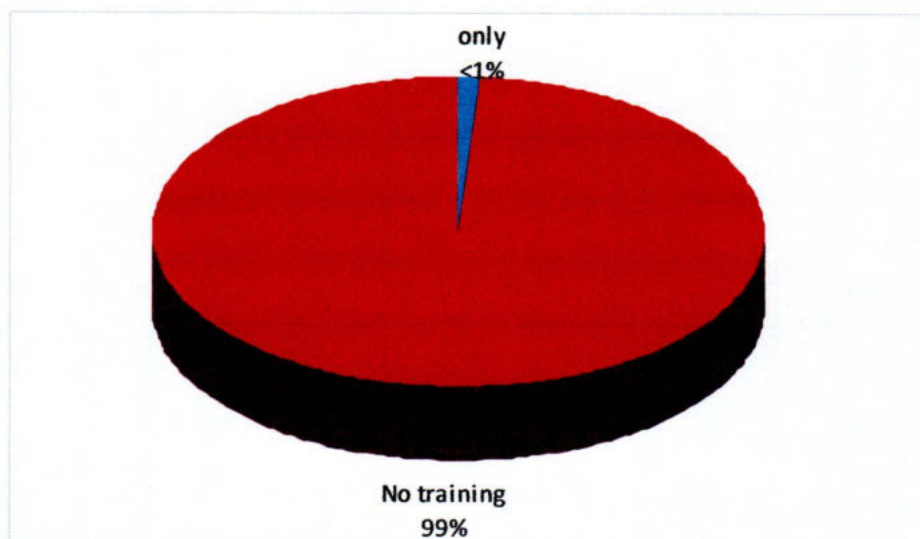


Figure 6: Provision of training regarding FP rearing

The survey revealed that among the poultry keepers (n=97) of the FP rearers only one has got the basic training from BRAC STEP program who worked as a community vaccinator of the project. Though villagers are rearing FP for a long time, they do not have any training facilities that may improve their skill in rearing. In the surveyed area a few peoples have got training on cattle rearing but not a basic training on FP rearing. Ahmed, (2000) mentioned that the lack of basic training is a major constraint in FP development; the same situation was prevailed in the surveyed area.

4.3 Persons in the family responsible for taking care of birds and ownership pattern of FP

It is clear from the Figure 7 that the women are solely responsible for the overall management of the FP. Guèye, (2005) mentioned that the women take after 75% of the daily activities and also decision maker for the family poultry which is close to the findings of the present study. The children caring the birds are under direct supervision of their mother, it may also be described that the children are in learning process. An interesting thing was that the daughters were more involved in FP rearing than the son. So on gender basis it is clear that the women are responsible for more than 85% of the family poultry management.

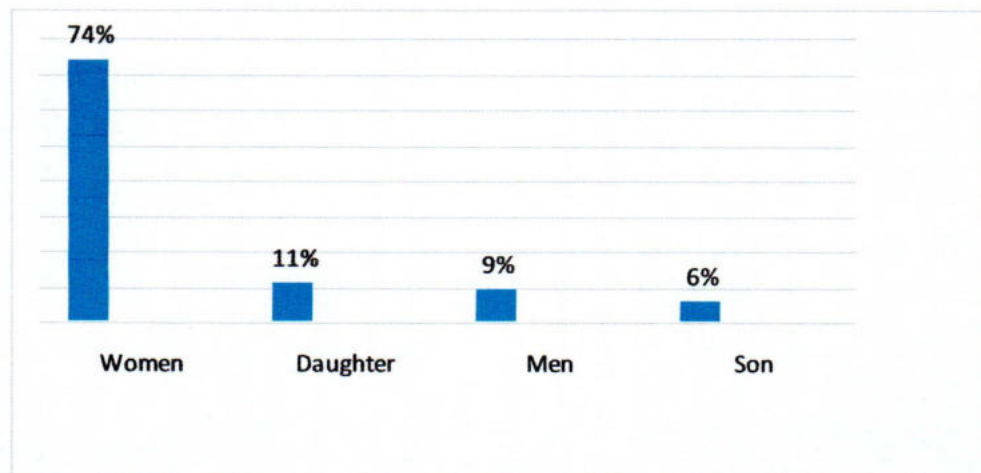


Figure 7: The responsibility bearer for FP rearing

The above figure shows that the women are playing a pivotal role in most of the decision making regarding FP rearing. During early morning women release the birds from the enclosure and provide feed to the birds, if the women stay outside the family the children plays the role and in some cases the male partner and other family members do it. So it is evident from the study area that women and children are the main responsibility bearer for FP rearing.

Some women reported that they owned poultry, because rearing and caring for poultry was part of their household work. Poultry provided those with their own source of spending money. Informants explained that during times when food is scarce, they sold their poultry or poultry by-products to meet daily needs.

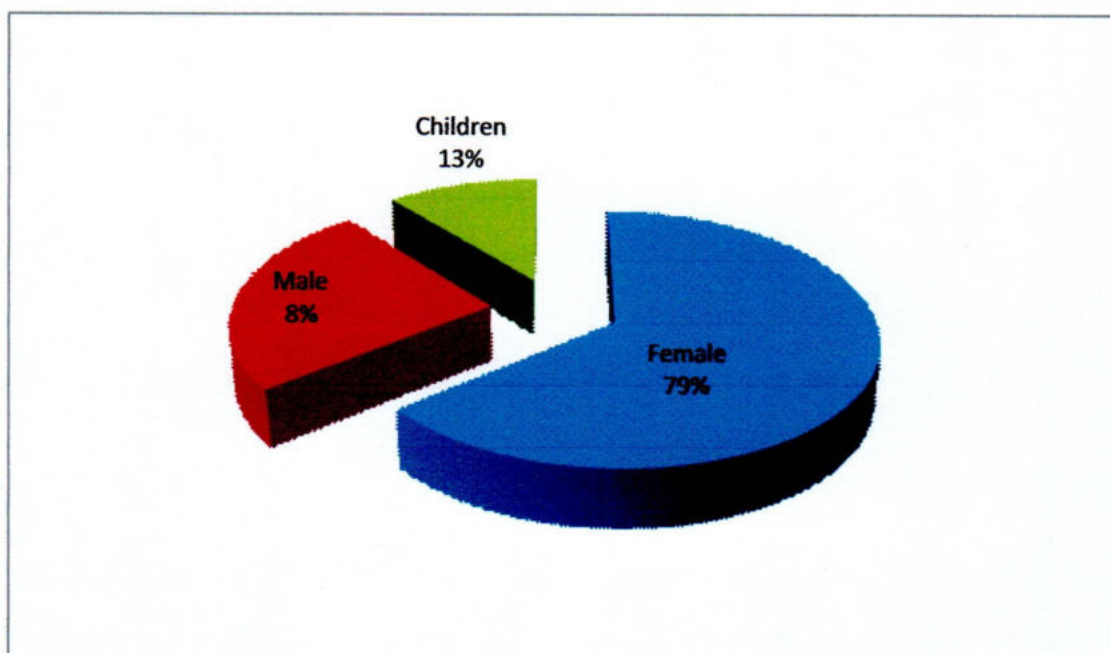


Figure 8: Ownership pattern of FP

Ownership pattern for family poultry is almost in the hand of women (Fig. 8). Children ownership is also an important factor, but the decision for the birds major issues are in the hand of their parents, so it will not be ambiguities if someone tells about that ownership for FP is totally in the hand of the women. In earlier studies (Saleque, 2001; Khan *et al.*, 2006) showed that 87% ownership of native chicken is in the hand of female. The current study supports these earlier findings. In a number of previous studies, similar pattern of ownership in native chicken were found in the study of Mapiye and Sibanda (2005) and Tadelle and Ogle (2000) they reported that more than 90% ownership of indigenous poultry is in the hand of women.

4.4 Situation, materials used, provision of ventilation and nest box to FP housing

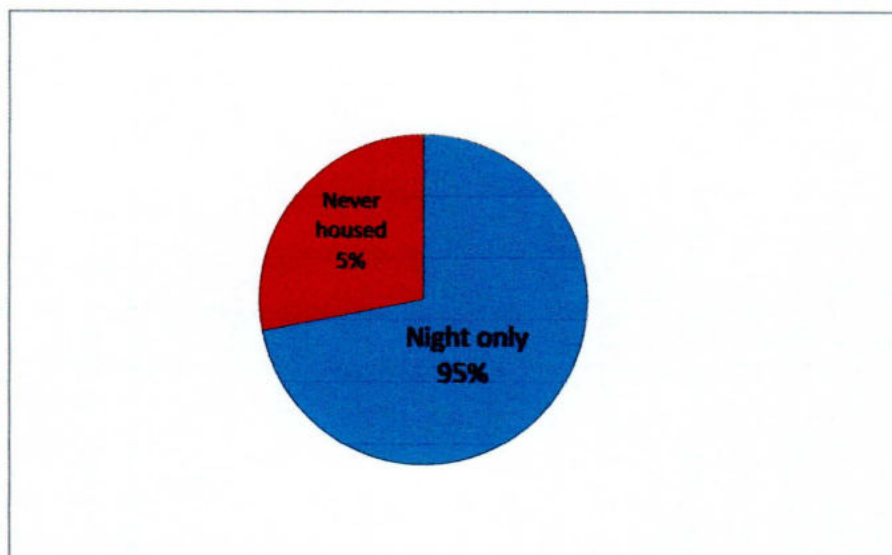


Figure 9: Housing situation

In the village the poultry keepers keep their poultry inside the bedroom at night to protect them from jungle cats, foxes and thieves. Some have a separate cage/night shed that they kept on the veranda or in the front yard. Many informants reported that they enclosed the poultry with a bamboo basket while keeping it inside the bedroom. They used separate baskets, cages/sheds and sometimes used a partition within the same shed. Similar findings also found in other two districts Netrokona and Rajshahi in Bangladesh by Sultana *et al.*, (2011). Some informants reported that they separated the ducks and chickens because they fight with each other, and ducks made the place dirtier and their feces smell more unpleasant.

Some poultry keepers do not have any housing for their birds, these birds spent most of the time in scavenging in surrounding, resting during day and night on a branch of tree, in the barn yard, at the top of gathered straw, roof of the house etc, but those birds lay eggs in the farmers house. Some respondents also believe that the tree living chickens are best due to its less disease attack, but some explained it difficult due to the fear from predator, thieves, wild cats and such other harmful things.

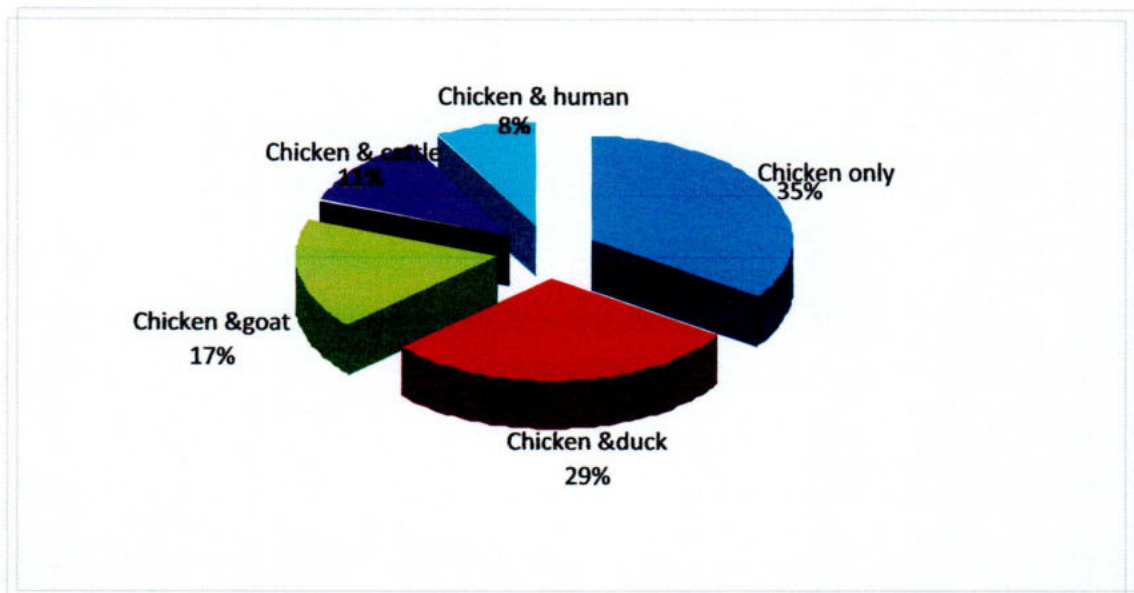


Figure 10: Family Poultry sharing house with others

Sharing of same house for poultry with other species may cause lots of difficulties in terms of disease control options and other management related issues. Of all common free-range poultry species, chickens are the most susceptible to disease. Poultry, other than chicken are often symptom-less carriers of chicken diseases. So it is better that one species of poultry should be housed separately overnight to avoid the spread of disease. But the current study revealed a fact that majority of the households share the same house for night shelter of chicken with other poultry and livestock species (Fig.10).

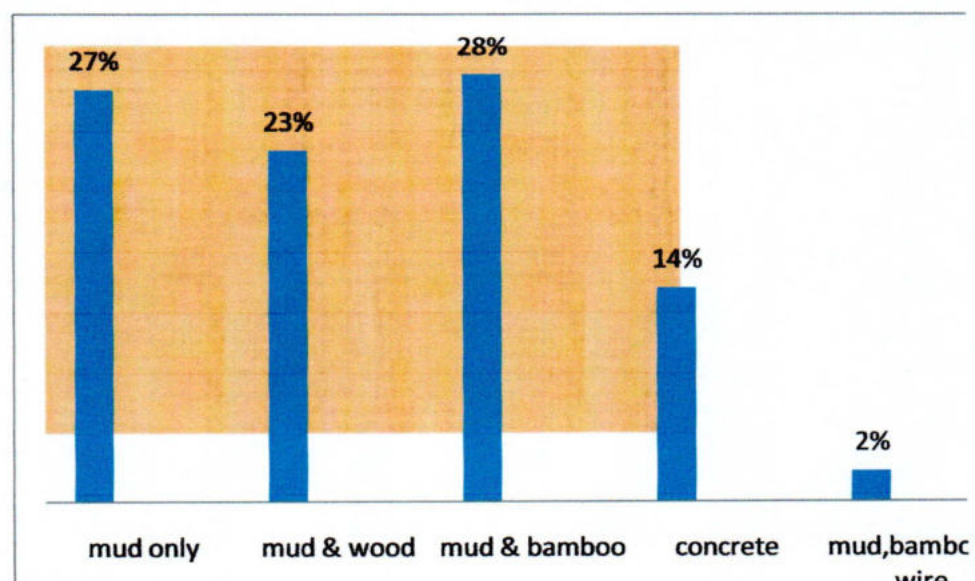


Figure 11: Housing materials for FP

Housing materials of the birds have shown in figure (Fig. 11). It is evident from the above chart that combination of mud and bamboo is the primary element of housing materials; it is also cost effective to them. Only mud made house is very easy to build and almost cost free. Concrete made house is also present at a significant level the respondent living in concrete made house was predominant in this case. The house made from the mud and wood or from the mud and bamboo is in the prime choice of the people. Some locally available materials used by farmers for the construction of chicken houses in Morocco include bamboo, wood, stones and plastic screens as noted by Benabdeljelil and Arfaoni (2001). Kumerasan *et al.* (2008) also reported the use of Bamboo and wood.

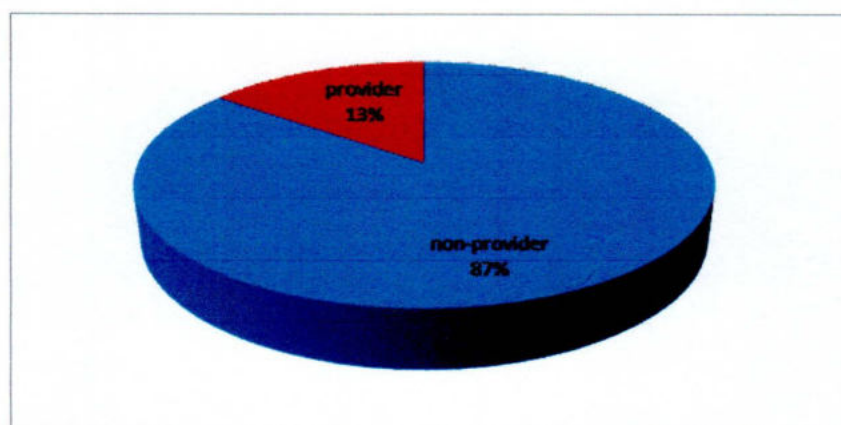


Figure 12. Provision of nest box for hen

Baskets, pots and cardboard boxes can be used as nests. Nests should be situated in a secure, shady secluded place out of the sun, lined with fresh litter and kept clean. In most of the houses people do not provide nest box, the birds usually lay eggs at the barn yard, in the corner of the room, sometime beneath the bed room of the people. Sometime the mud made nest box present in some house but it is very limited. The majority of informants reported that they prepared a place for chickens to lay and brood eggs inside the bedroom, either under the bed or on the window sill.

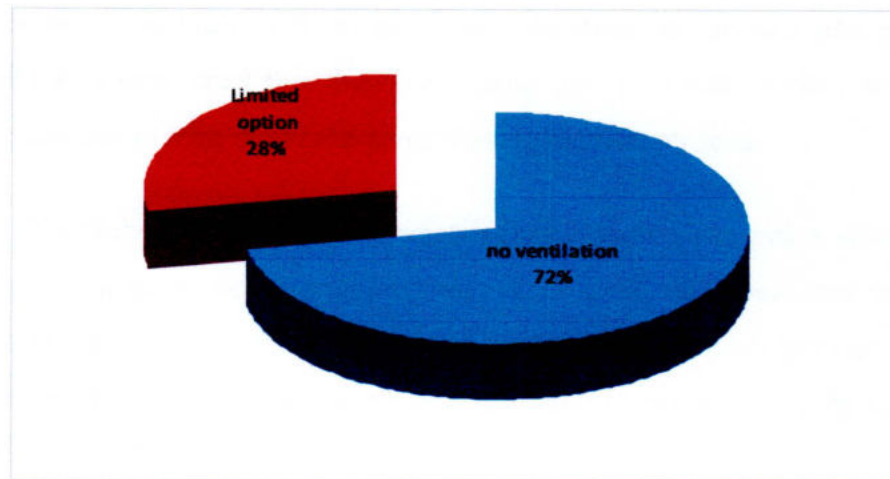


Fig13: Option for ventilation

Ventilation is an important part of poultry rearing but it is clear from the Figure 13 that only 28% households had the provision for ventilation. In comparison with the commercial poultry production, the ventilation facility was so poor, those have a small window or a bamboo built house and have a slight opening at side, which considered as limited option for ventilation. But in real sense the option for ventilation is totally absent for FP production, it is also a major cause for prevalence of disease in the family poultry production. During winter the farmer provides a gunny bags to close the window of the birds shed. The birds only get fresh air when they are under scavenging condition, but at night time resting they have no access to air and the farmers do not consider the space requirement for the birds. The prevalence of disease may be due to the poor ventilation system in houses for FP rearing.

4.5 Feed resources, feeding, and water supply to the birds

It was observed from direct observation and interviews with keepers that the major feed sources for village chickens are household wastages, earthworms, insects, seeds, green leaves and other plant materials found in household yards. The nutrients available to locally scavenging chickens are generally deficient; not only does their availability vary with the seasons of the year and the localities. The commonest source of chicken feed was through scavenging with little supplementation and irregular supply of water.

Huque, (1999) in his study in Bangladesh concluded that the nutrients obtained by hens from scavenging around the homestead in a range of locations did not have enough

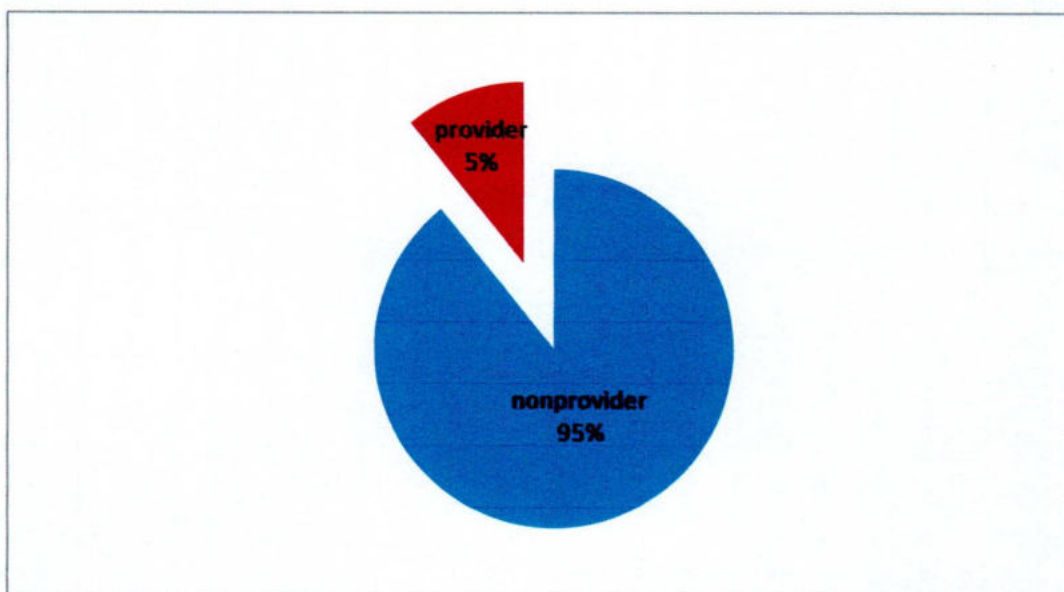


Figure 15: Water supply for birds

In survey area most of the people do not recognize that the birds have any need for the water, they believe birds are capable of consuming adequate water through scavenging. The water supply in actual figure is very low for chicken, in some circumstances people provides new brood ,new comer, or to sick birds with others for recognition of homestead area. Here the proportion is so meager. Farmer even considered that the birds have no need of water at night when they are in enclosure as mentioned by Niranjana *et al.* (2008) the same attitude of farmers in the study area was viewed.

Although few keepers have mentioned they provided water to newly hatched chicks, but the direct observation in the study areas, elucidated that chickens were provided with water. It was also observed that the major sources of drinking water for FP were tube-well canal that villagers used for bathing and washing utensils and clothes, pond, drain, sewerage, and any water logging. During the survey both ducks and chickens were seen drinking from the same container which is used as water trough. In most households, no drinkers were seen; they used mud made pot, plastic container, plate etc whenever needed.

4.6 Hatching, criteria and source of replacement for FP

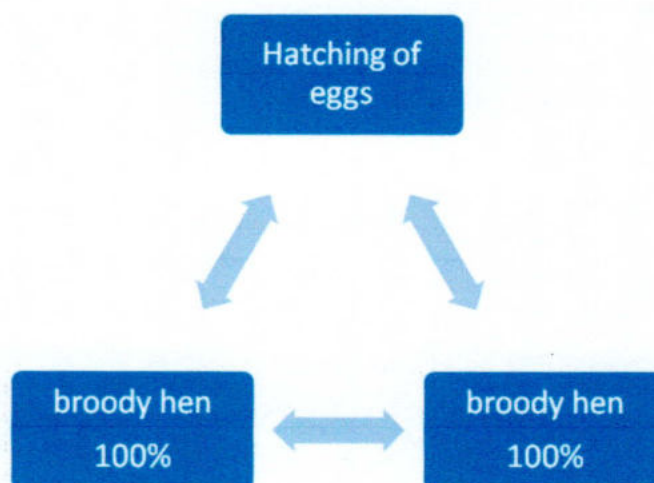


Figure 16: Hatching of FP eggs

Hatching of eggs is an important task in FP rearing, use of broody hen to hatch eggs to chicks is the normal practice in backyard poultry worldwide. Broodiness is the action or behavioral tendency to sit on a clutch of eggs to incubate them. Native hens are one of the best broody chickens as argued by many researchers Kumar *et al.*, (2008). FP rearer in the study area reported that about cent percent households are fully dependent upon the broody hen for hatching eggs for the production of new offspring. They never done any selection for the hatching eggs, they also mentioned normally first year laying hens are avoided to hatch eggs, they think the new mother is not capable of producing enough heat to hatch the eggs and even it will hamper the proper growth of the birds. No candling was done to make sure that the egg is either fertile or not. Some believe that touching of an egg after setting may not be accepted by the birds for incubating. Farmers do not clean the eggs prior to setting. Using a broody hen to raise the chicks provides several additional benefits. The mother forages natural foods including insects for her chicks, keeps her young ones warm even when ranging on pasture and through cooler weather, and provides devoted protection from predators. The hatching of duck eggs was also done by 100% with the broody hen.

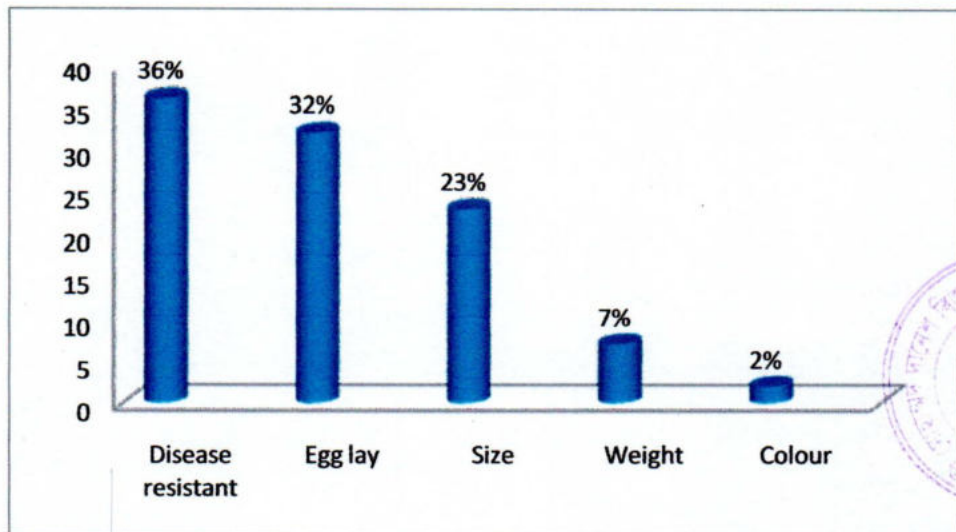


Figure 17: Criteria for flock replacement

Flock replacement is an important criterion for chicken rearing practice. During disease outbreak, migration, natural death and a lot of reasons, the existing flocks needed to be changed. However, farmers do not do emphasis over a single criterion but they provide more emphasis on the combination of two or more reasons. Disease resistant, egg lay and size of birds are the prime criteria. Some respondents have reported that they prefer chicken that keep the newly hatched chicken with them for more time, this system ensure survivability of a high number of chicken, because the mother takes care of her young for a long time. But this criteria matching is very hard for them due to the birds normally do not exhibit such behavior despite having the proven track record from the rearer. Color and weight are the minor factors for replacement purpose. There is a liking for the red or mixed color birds. People of this area do not interested in rearing of the naked neck chicken, rather they think it is not so good for rearing, some express their strong disliking due to naked neck. Disease resistant is a controversial situation, no such scientific background present here. They have purchased birds from a variety of source regardless of the education and social context farmers mostly keep their strong faith over the neighbors flock, they consider it best over the other sources.

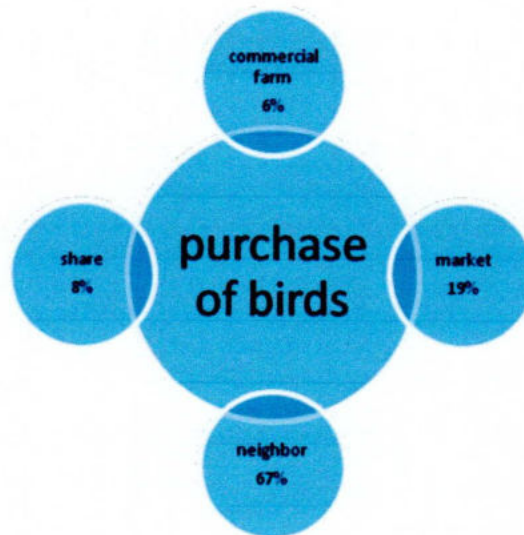


Figure 18: Showing the purchase pattern of the FP

Purchases from commercial farm include the purchase of a crossbred chicken of improved productivity locally known as Sonali (RIR male × Fayoumi female).

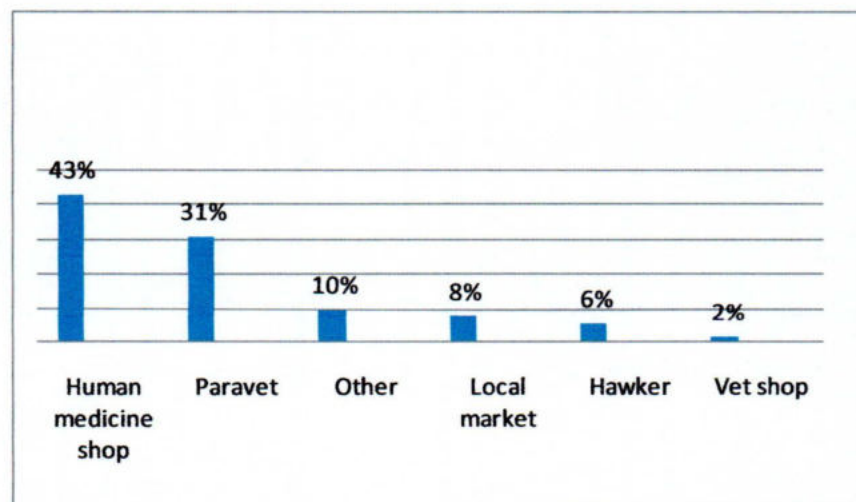


Figure 19: Places from where villagers purchase poultry medicine

Human medicine stores were the dominant source of poultry medicines, farmers purchase medicines for the treatment of their birds from medicine stores, while there is hardly any purchase of poultry vaccine. Semi trained Para-veterinarians are the big seller of medicine to the FP rearer though they do not have enough understanding about poultry diseases and medicines. The hawker is an important actor in poultry medicine

market, they sell the medicine by announcing into the village or during sell at the market date, the type of medicine sell by the hawker is questionable and even the farmers put doubt about the efficacy of this medicine, but preference for its low price and alluring speech. Local markets include the seller who sells medicine with other human or vets medicine at temporary shops in the locality during market day.

4.7 Ground situation of veterinary input services to the FP

DLS has the mandate to ensure vaccination program to protect the animals and birds from various contagious diseases but our survey revealed (Table 2) that minimum number of households vaccinated their birds.

Table 2: Livestock and poultry immunization within one year

Species	No. of Animals	% of Animals	No. of households	% households	Pattern of uses	Comments
Poultry (chicken/duck)	23	4.46	6	5	Infrequently	BCRDV only

The FP keepers informed that they only make vaccination for their animals and birds when the government vaccinator comes to them; they had no initiative for that.

The Table 2 indicates low vaccination coverage in the surveyed village, for each type of species vaccination has done in an irregular basis. In a number of previous studies (Barman and Flensburg, 2010); Rabbani *et al.* (2004) similar pattern on immunization of rural livestock was found.

Table 3: Availability of poultry vaccines in local Department of Livestock Service Offices

Species	Name of the disease	Name of the vaccine	Dose per vial	Price per vial (Taka)	Price per dose (Taka)	Availability
Chicken	Newcastle Disease	BCRDV	100	15	0.15	Available
		RDV				
	Fowl Pox		200	40	0.20	Available
	Gumboro		1000	200	0.20	Partially available
	Salmonella		200	90	0.45	Partially available
	Fowl Cholera		100	30	0.30	Partially available
Duck	Duck Plague		100	30	0.30	Partially available
	Fowl Cholera		100	30	0.30	Partially available

Source: Personal communication with Upazilla (sub-district) Livestock Officer (ULO)
 Here, BCRDV=Baby Chick Ranikhet Disease Vaccine, RDV= Ranikhet Disease Vaccine.

In Bangladesh Livestock Research Institute (LRI) is the unique institution for vaccine production for the animals and birds in government level under the Department of Livestock Services (DLS). Poultry vaccines are not free of charge, but it appeared affordable even by the rural poor people as the cost of per dose vaccine ranges from only 0.15 to 0.45 taka (Table 3).

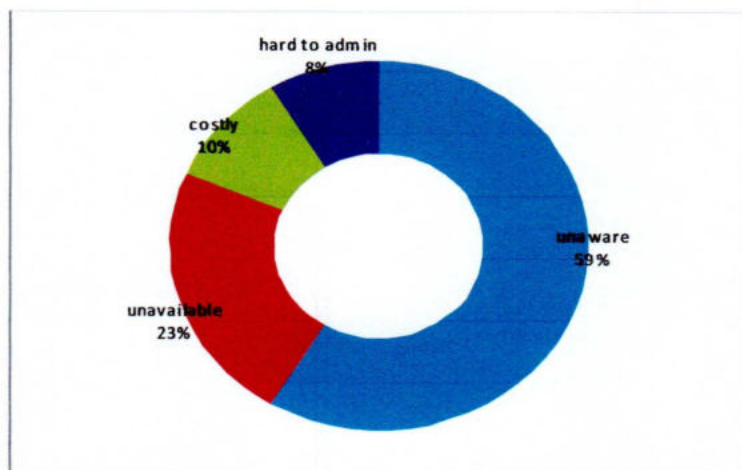


Figure 20: Reasons for not vaccinating birds

Our investigation indicates the coverage of FP vaccination is negligible; most of the rural poultry are not routinely vaccinated against any diseases (Table 2). Figure 20 shows key barriers to low vaccination coverage in FP in the rural communities. However, even if the vaccine supply increases to meet the demand, there is currently insufficient government veterinary staff to vaccinate all animals and birds (Personal communication with sub-district officer). The total vaccine production and supply for animals and birds can only supply 10.0 per cent of the required vaccines as noted by Nasrin and Hafezur, (2003). It was noted that about 58% of the respondents have a low level of knowledge and understanding regarding benefaction of immunization for their poultry. Even, they don't know where to find vaccines or who are responsible authority to vaccination. Unavailability is also big problems to FP immunization in rural areas of Bangladesh, poultry keepers have to travel a long distance to buy vaccines and difficulty in managing cold chain in rural areas is also an immense problem for FP vaccination. In a real sense, poultry vaccines are not costly but ownership pattern of 2-6 birds per household make it costly because the smallest vial size of vaccine is for minimum 100 doses.

Nasrin and Hafezur (2003) mentioned three main reasons for poor coverage of backyard poultry vaccination those are lack of farmer awareness, inadequate infrastructure for cold chain management along in rural areas and very limited manpower with one vet or para-vet managing about 25-30 villages.

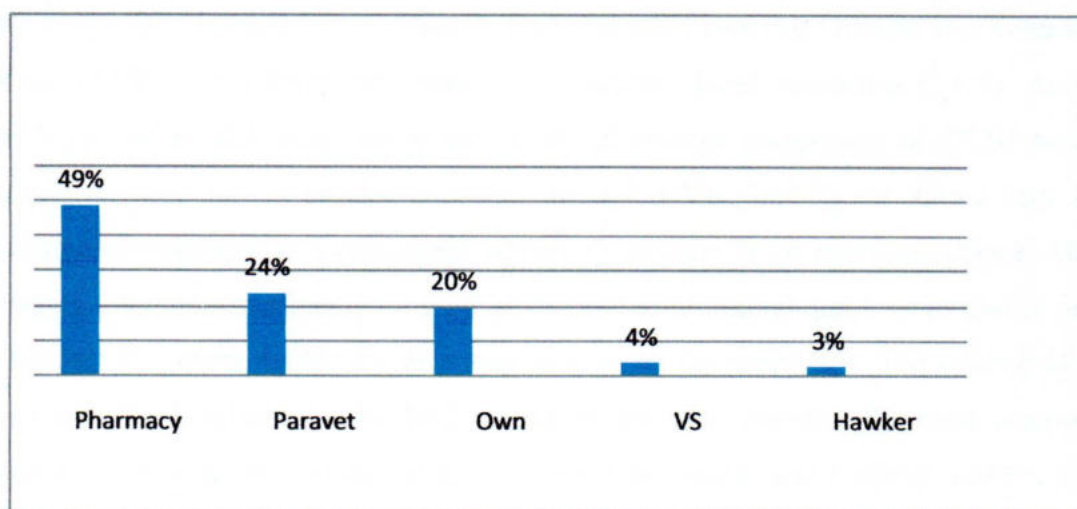


Figure 21: Source of veterinary products used for Family Poultry

The FP is almost a neglected enterprise in poultry sector, consultations by poultry and livestock service providers are either absent or too limited. Farmers generally use the antibiotics like oxy-tetracycline to prevent the disease; they do not even have any idea about the drugs they however know the trade name RENAMYCIN (for human ailment) bought from rural market for treatment. This happens because farmers lack of knowledge about availability of modern drugs, inadequate resource to seek advice from veterinarians and faith in traditional knowledge on poultry management through the use local herbal medicine. The pharmacist includes both the human and veterinary pharmacist, in study area both type of medicine (human & vet) was sold by the same personnel. Para-vets are the local service providers for the FP, most of the time they carry some drugs to be used for ruminants but they sometimes intentionally sold to farmers who are engaged in rearing FP by dividing ruminant drugs into small fraction or by crushing it for FP treatment.

In Bangladesh livestock health and input services are delivered to the farmers by various organizations like the Department of Livestock Services (DLS) and Bangladesh Livestock Research Institute (BLRI), a number of local and international Non-Governmental Organizations (NGOs), Cooperative Societies and private organizations. Under the Ministry of Fisheries and Livestock (MOFL) DLS is the apex body, which implements and coordinates all livestock services activities in Bangladesh. Generally the Upazila (sub-district) Veterinary Hospitals (UVH) functions as nucleus of all marginal DLS activities at grass root level. Normally each of the UVH are encompassed with

contaminate the environment. (ii) The disease tends to be seasonal, occurring after mosquito breeding times. (iii) The disease virus can transmit by Mosquitoes and other blood-sucking insects.

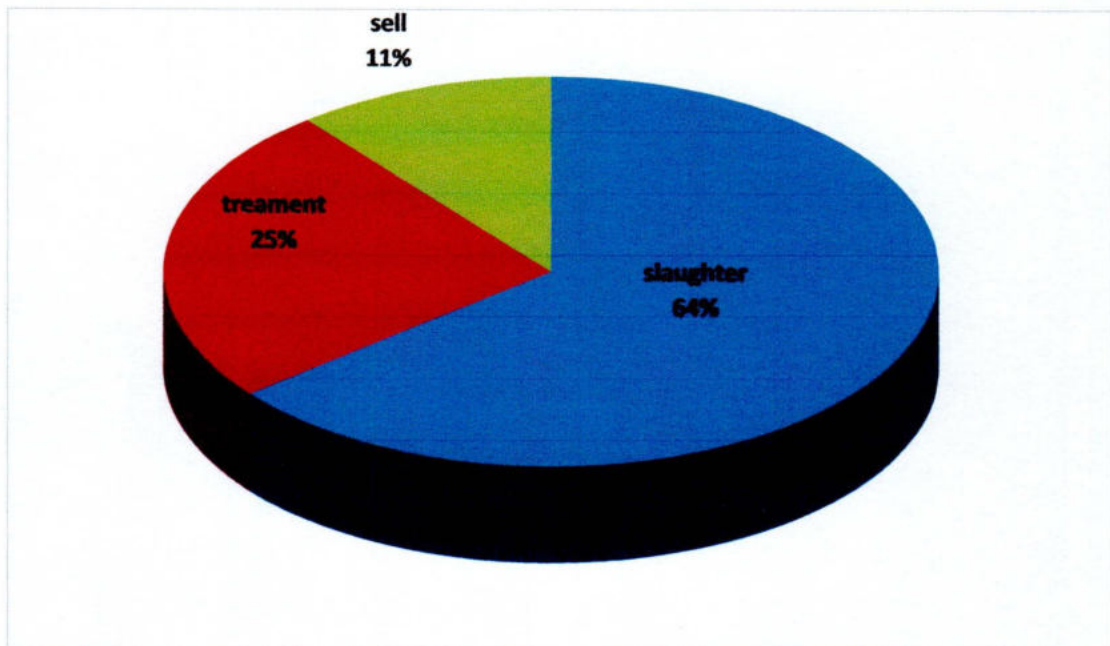


Figure 23: Fate of sick birds in the households

Initially the FP keepers make intervention for the treatment but most of the cases it failed, due to no use of specific drugs which tends to get no response to treatment and finally the birds are slaughtered for consumption. It was found in study area that people at first try to treat their birds but they do not have any idea about where to get proper treatment, which medicine they will use to treat and the cost of the treatment. During outbreak of disease, the people sell their birds to the market or neighbor to reduce the risk; this tendency is more prevalent where the flock size is larger. In case of smaller flock size the rearer recognized that they can purchase medicine and try to make treatment for the diseased birds, if one or two birds died due to the illness they think that the disease will attack whole the flock and the farmer gradually make slaughtering of their birds or sell. Most of the family recognized that they slaughter the birds if even it seriously ill, people do not consider it harmful to eat. The use of traditional medicine (herbal) by farmers in the study areas may be due to its low cost, availability and ease of application compare to modern veterinary medicine.

4.9 Health and sanitation related activities to FP by the villagers

Birds are kept outside from the shed during the cleaning operation; this practice is more prevalent in this study area. People used to keep the birds away from the shed early in the morning and the women clean the shed when they make cleaning of their household in the morning.

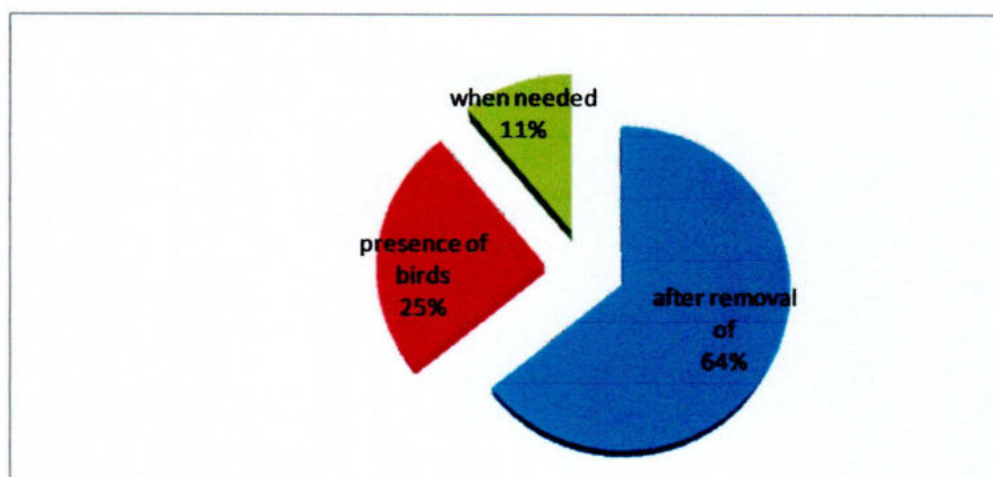


Figure 24: Birds position during shed cleaning

It is a nice practice for the FP rearer, and it also provides easy cleaning for the farmer. When the birds got sick or in the incubation or brooding stage under its mother care only then farmer clean the shed in the presence of birds. Shed cleaning is associated with the sanitation and hygienic management of the flock. Only 11% of respondents clean the shed immediately after findings birds dropping. Shed cleaning is done mainly in the morning and some respondents do it in the late afternoon.

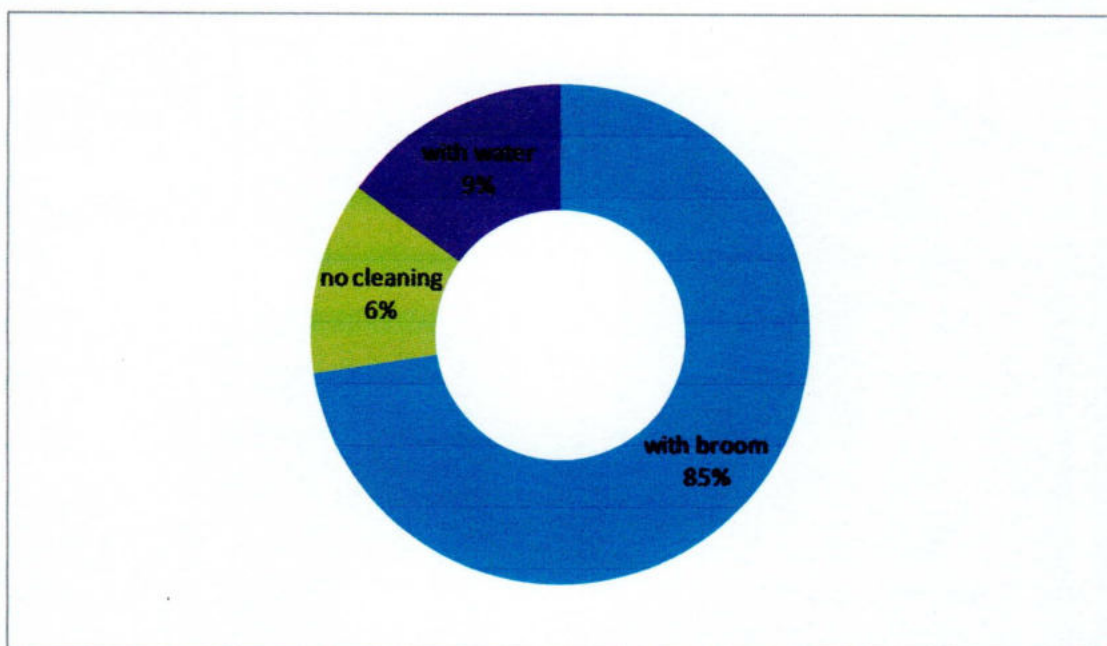


Figure 25: Shed cleaning tools

Shed cleaning is necessary for improved ventilation, hygienic condition, reduced droppings and prevents ammonia intoxication. FP keepers mainly used bamboo made broom (locally called jharu) for cleaning the shed; they have never used the chemical disinfectant for cleaning the shed. In many cases, for month after month birds dropping is deposited into the same shed but no cleaning and disinfection has not yet taken. This type of shed itself is a major reservoir of the disease itself. It may also a vital factor for increased mortality of native chicken. Only 9% of the respondents use water for cleaning the shed, some respondents said that they smear a layer of mud (locally it is called “Lepa”) half yearly over the floor of the shed. During winter farmers use ash or straw as litter material for protecting the birds from the cold. However they do not think of fresh air requirement for the birds.

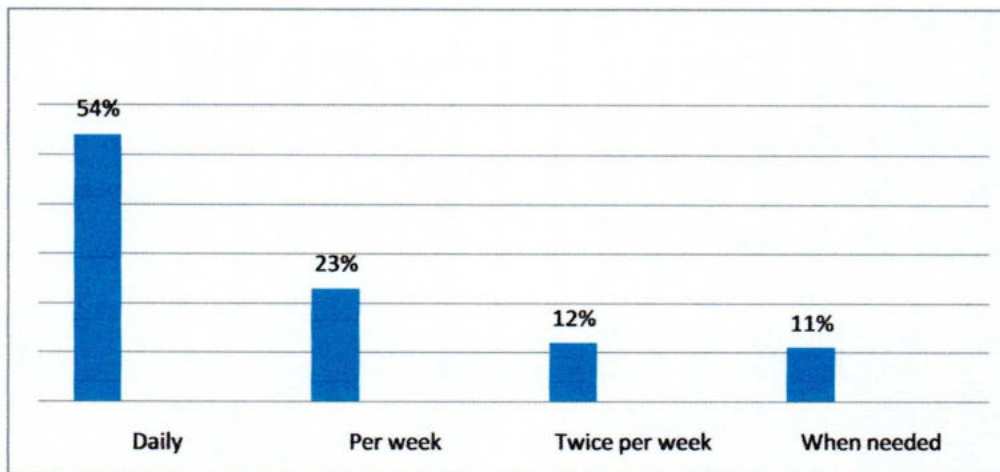


Figure 26: Shed cleaning frequencies

The shed which is situated in closure of bed room the farmers make the regular cleaning of these shed. Nair *et al.*, (2000) mentioned that FP rearer believe that the removal of faeces from the household premises is the sufficient measures to keep the homestead and house healthy. During the survey and direct observation in the household there excreted droppings in the every corner of the households. The female and the children are the key personnel for removing the droppings from the house. They even sometime washed out the droppings from the bedroom into the kitchen yard, the dropping stay in the house yard over night or even sometime for the whole week.

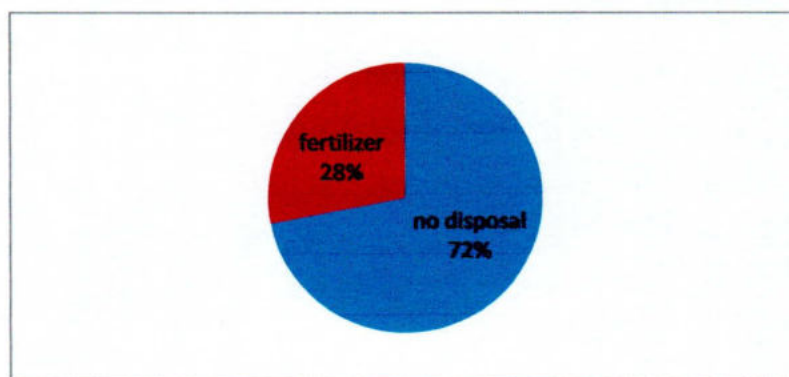


Figure 27: Disposal of poultry manure

The women mentioned that it is their duty to clean up poultry faeces or the poultry sheds once a day. Those who kept their poultry inside the bed room cleaned the room every morning. Those who kept poultry in sheds cleaned the sheds every 2–4 days. It is observed that most of the women scattered ash or dust on the feces to soak up the moisture and then scrap up the feces with a hoe and/or broom and deposited it into a place where all household wastes are thrown. Then they put it under the trees or beside the house to preserve it for making bio-fertilizer. During direct observations, poultry feces were seen all over the household premises, including inside the bedroom, the kitchen, on the veranda, and in the yard, where they remained for several hours. True sense of manure disposal from family poultry is not found in any observation. The faeces mixed with the cow dung or such other kitchen scrapes and then piled in a place for further use in paddy or potato field. For disposal the faeces is washed away from the veranda or yard and then thrown outside the home into jungle or other places.

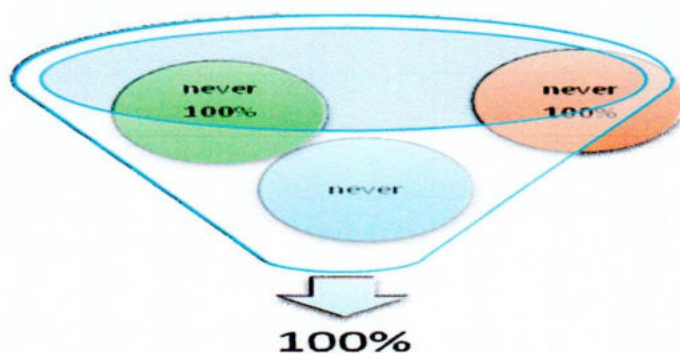


Figure 28: Treatment of nest box with medicine

The nest box where birds lay their eggs was never treated with medicine to prevent disease. Respondents use ash or chopped straw or rice husk with the eggs. Sometimes, people insert an extra egg to encourage laying. Few people reported that during the brood time the chicken stand more time over the eggs and due to the use of rice husk for keeping a warm environment for eggs, it resulted in the infestation with lice. But they had not ever taken any initiative to overcome the problem.

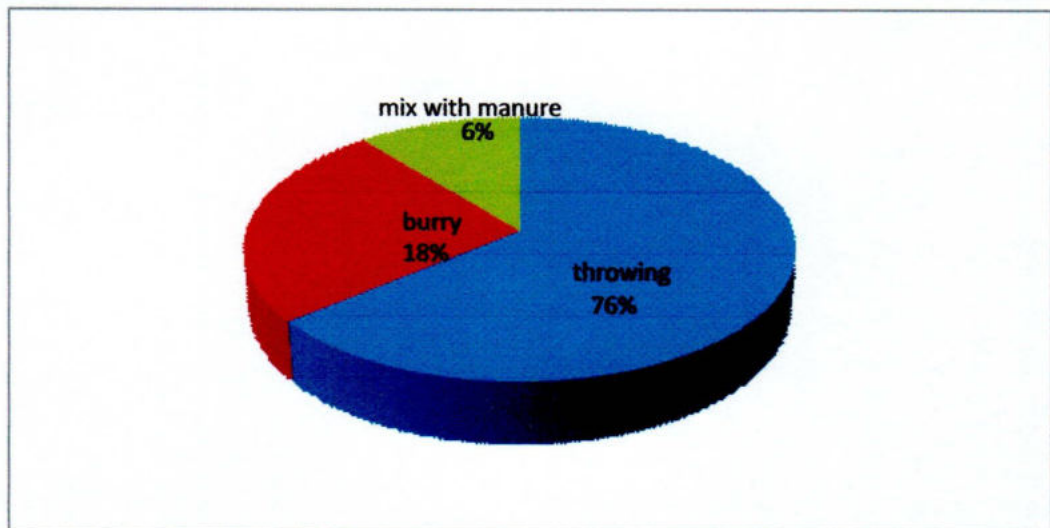


Figure 29: Disposal of dead birds

Droppings, feathers and dead birds are sources of pathogens and should be removed from overnight housing and then properly disposed Alam *et al.* (1997). This will also reduce the incidence of external parasites. Peoples in the study area do not properly dispose the dead birds; they mostly throw the dead birds into the jungle or outside the yard. They even do not know the things may be the reservoir for a lot of disease. It may also be a basic reason for the high mortality of the birds. A very few rearers (18%) follow burial method for disposal of birds, but they do not even follow any scientific procedure or process at the time of disposal of birds. FP rearers do not believe that the dead chicken may become a source of infection to their live birds. In case of mixing with manure it is linked with the cow dung and other household wastes. Although the study area is not lodged in high forest or jungle, the people dispose their birds into the jungle or in any agricultural land. The dispose area was of bamboo garden, mango orchard, jackfruit garden, paddy field, or even the crop cultivating land. The above mentioned places are also the ranging area for the birds.

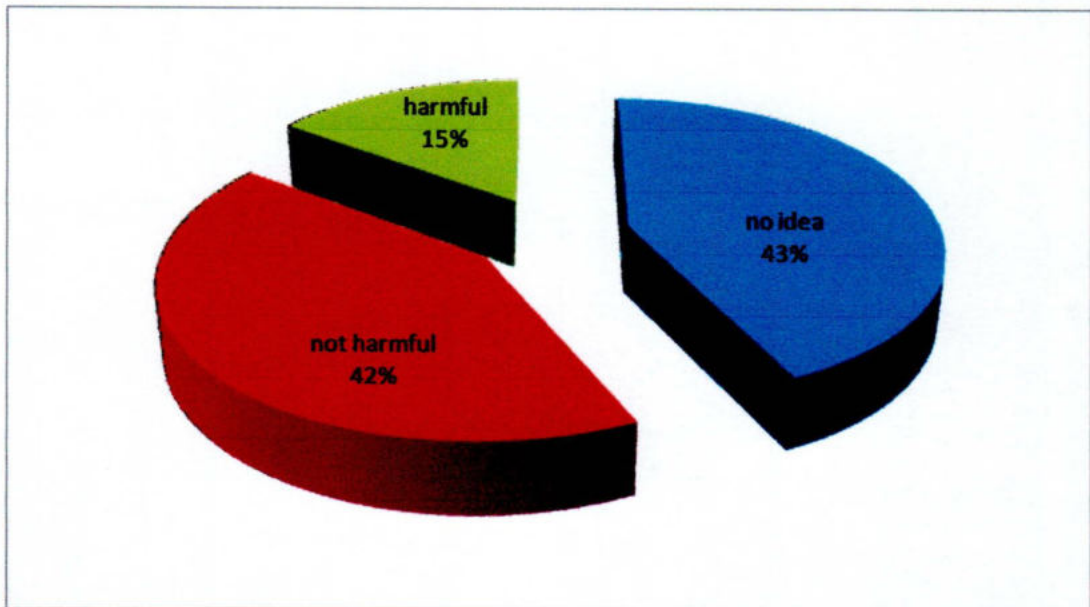


Figure 30: Perception of poultry keepers about impact of poultry disease on public health

The common diseases and disorders of free-range poultry may be either infectious or noninfectious, and are caused by a wide range of organisms or deficiencies. As a part of poultry raising activities, raisers had close contact with their poultry including touching them while putting them into sheds, feeding sick poultry by hand, and killing, defeathering and butchering of poultry. Figure 30 shows that the respondents have very limited idea about the transmission of diseases from diseased birds to the healthy ones, the summation of not harmful and no idea comprise more than 85% of respondents. It clearly indicates that the rural FP rearers are in high chance to be infected with inter-communicable poultry diseases. Keeping poultry inside the bedroom and being exposed to faeces, and to water bodies shared with ducks have been suggested as potential risk exposures to avian influenza in human cases Sultana *et al.*, (2011). Women appeared to be at greater risk of disease transmission because they were in direct contact through multiple interactions such as de-feathering and butchering. Children also appeared to be at high risk because they assisted in poultry slaughtering, played with the raw meat and touched poultry during routine chores. They did not recognize various signs of illness in their flocks and thus did not perceive the existence of avian influenza.

genetic dimensions. Economically, losses are a direct result of mortality, medication costs, veterinary services costs, downgrades, depopulation, lower production, and poorer feed efficiency (Lamont, 1998). This makes it difficult for the low resource farmers to participate in local and even the national livestock economy (Sonaiya and Swan, 2004). Due to inappropriate housing and extensive scavenging birds are often fall into the easy prey to wild cat, predator birds, thieves etc; and sometimes birds are fell into accident in roads.

4.8 Existing practice of Lice, Mite and Pox treatment in FP by the villagers

Lice infestation is common under free range and scavenging system but is not treated. Herbal treatment initiatives include the leaf of Milk weed locally known as akunda in combination with mustard oil and turmeric is common. Some rearer reported that they use crushed onion mixing with the ash to treat the lice problem. From hawker, they purchase a chalk that contains unknown chemicals and used it in the shed of bird. Some respondent reported that they make bathing of their chicken in the pond, and also dip the net /bamboo made house of bird dipping into the pond. Some used the tobacco (Gul) with the ashes to remove the lice from the birds. In the study area, FP rearer did not consider it as a more complex disease.

Mites are troublesome ecto-parasites, which hide in the cracks of house and perches, and come out only at night. In the study area, FP rearer only informed about the presence of red mite on their birds. After manual removal of red mite by hand from the affected area, the farmers mixed turmeric powder with the mustard oil and then applied it on the mite attached part. Some respondents reported about the use of green turmeric in treating the mite.

In Bangladesh, the clinical pox has been reported in chicken either in single (50%) or with mixed (50%) infection in age between 8 to 20 weeks (Samad, 2013). The procedure for the treatment of pox is almost the same as for mite and lice in the study area. Very few of FP rearers use only potassium permanganate soaking with water to smear over the pock lesion. Rahman *et al.* (2007) mentioned that Fowl pox is still a prevalent in many poultry flocks of scavenging system for three reasons: (i) The fowl pox virus can remain alive in the pox scabs (which have fallen off the birds) for up to ten years, which



CHAPTER V

SUMMARY AND CONCLUSION

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The study has enumerated a number of findings from the household survey and focus group discussions and brought to light a number of conclusions. In this study it has been found out that about 77% of the village family rear FP with an average 6 per holding under scavenging systems. Most of the family rearing poultry for a long time and majority of them kept small flock size of less than 5 birds. Family consumption is the prime use of FP rearing along with little amount for sell and hobby.

Access to credit to FP production may be a major mechanism with which a household can improve its productivity, but after the study it has been identified that none of the smallholder poultry keepers ever received any credit from both government and non-government organization for their birds. The survey also revealed that less than 1% of the respondents got training on poultry production. It was clear from the findings that the women are responsible for more than 85% of the family poultry management and 79% of the ownerships is the hand of the women.

Although it is better that one species of poultry should be housed separately overnight to avoid the spread of disease, but the current study revealed a fact that majority of the households share the same house for night shelter of chicken with other poultry species and livestock species and even share with their pets. Mud is the principal material for building poultry house with bamboo and wood, except in very few cases where concrete made houses were observed. The study also revealed that provision of nest box for hen is limited in the village flock and the majority of informants reported that they prepared a place for chickens to lay and brood eggs inside the bedroom, either under the bed or on the window sill. In real sense, the option for ventilation in the poultry house was totally absent for FP production, it may be a major cause for prevalence of disease in the FP.

It was noted from direct observation and interviews with FP keepers that the major feed sources for village chickens are household wastages, earthworms, insects, seeds, green leaves and other plant materials through scavenging with little supplementation of broken rice, rice husk, paddy, wheat, maize crust and irregular supply of water. It was

also observed that the major sources of drinking water for FP are tube-well and canal that villagers used for bathing and washing utensils and clothes.

Respondents in the study area reported that about cent percent households are fully dependent upon the broody hen to hatch eggs and take care of chicks during their early age, they usually don't take any selection for hatching eggs. Villagers generally rely on neighbor's flock as replacement birds, they mostly express their strong faith over the neighbors flock, and they consider it best over other sources.

The report also revealed that the major losses of birds are due to diseases and the degree of vaccination to the FP is very low or negligible. The veterinary service delivery at village level is inadequate, ineffective and infrequent; only 4% of the households received service for their poultry from veterinary surgeon. Most of the villagers depend on pharmacy and para-vet for treatment of their sick birds. The people who are most deprived of these services are the poor, and eventually those who live in remote areas. Normally villagers don't take treatment for sick birds, most of the families mentioned that they slaughter birds when they become seriously ill, people do not think of whether it is harmful to eat or not.

FP rearer mostly used bamboo made broom (locally called jharu) for cleaning the poultry house; and they also never used the chemical disinfectant for cleaning the shed. In many cases, for month after month birds dropping is deposited into the same house but no cleaning and disinfection has not yet taken. The nest box where birds lay their eggs was never been treated with medicine to prevent disease, people use ash or chopped straw and rice husk with the eggs. Peoples in the study area do not properly dispose the dead birds; they mostly throw the dead birds into the jungle or outside the yard. The study also disclosed that the respondents have very limited idea about the transmission of diseases from diseased birds. In the findings, the summation of not harmful and no idea comprise more than 85% of respondents. It clearly indicates that the rural FP rearers are in high chance to be infected with inter-communicable poultry diseases like avian influenza.

Institutional structures are not favorable to smallholder poultry production. The interventions that could enhance productivity should be introduced, but the animal health services needed to promote these interventions are, in general, poorly developed.

Government livestock service delivery networks necessarily need to be improved to the village poultry keepers.

Basic training of poultry keepers based on participatory approach regarding the rearing of poultry is needed to enhance the production of FP. Awareness building as well as vaccine delivery system should be more convenient to reduce the losses of poultry due to diseases, especially ND. Credit supply to the poor villagers for smallholding backyard poultry production would be beneficial to boost up the number of poultry in the rural communities.

This study will help policy makers, development agents and service providers to better understand the rearing characteristics of backyard poultry in rural communities in Bangladesh. Moreover, it has successfully tested a methodology that can be used in similar types of researches.



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QUESTIONNAIRE OF THESIS

Personal Details:

Name:.....Village.....Upazilla,.....

District.....Male/Female.....Age.....

Ethnicity..... Local language..... Head of the family.....

Education.....No of family members.....

1 .General understanding about poultry rearing

A .No of birds kept by household

Sl.no	chicken	Duck	pigeon	Cattle	goat	pet	Manure disposal	purpose
Total								

B .Credit facilities- Yes

No

Management issues

A.Disposal of manure

No disposal	Feed to other animal	Fertilizers	Others

B.Housing materials

Mud only	Mud+wood	Mud+bamboo	concrete	Wood+mud+wire

C. Option for ventilation

yes	No

D .Water supply to your birds

yes	No	Frequency

E. Source of water for birds.....

F. Antibiotics, growth promoter, mineral supplementation in water

Provider	no provider

G. Nest box provider

Provider	No provider

H. Nest box treated with medicine- Yes No

I. Do you hatch your eggs- Yes No

j. Criteria for replacement of your flock

size	wt	Disease resistant	Color	longevity	No criteria	Egg lay	Increased maternal instinct



QUESTIONNAIRE OF THESIS

MARKET AND SELLS RELATED ISSUES

A. Principal utilization of eggs and meat

item	consume	Sell	share	other
Egg				
meat				

B. Who possess the birds

Men	women	Children	Share	other

C. Do you purchase chicken for your flock - Yes No

D.If yes then mention from where

market	neighbor	Share	Commercial farm	others

D. Who in the family responsible for selling

item	male	female	children
Bird			
egg			

E. Where do you sell birds or eggs

market	neighbor	share	Local vendor	other

F. What is the better source of birds for rearing.....

G. Where do you purchase poultry drugs and vaccines

Vet shop	Human shop	p.vet	hawker

VETERINARY SERVICES

A. Why do not you vaccinate your birds.....

unaware	costly	unavailable	Hard to admin	Other

B. From whom you receive your veterinary services

own	vs	pvt	pharmacy	hawker

C. Have you ever been to your veterinary hospital?

Yes	no

D. Who in your family vaccinate birds.....

E. Name the most important losses for your bird

disease	predators	Accident	thief	other

F. How would you treat a lice problem?

Vet advice	herbal	Medicine from pharmacy	hawker	own

G. Do you know about the price of poultry vaccine

H. What type of birds do you purchase for your flock

pullet	chicken	mature	Other

HEALTH AND SANITATION RELATED ISSUES

A. Do your birds have contact with other birds

Cattle	Goat/sheep	duck	pigeon	pet

B. When do you clean your shed

After removal of birds	Presence of birds	When needed	Other

C. Shed cleaning practice

Jharu/Broom	Disinfectant	water	herbal

D. Do you regularly clean your shed

When needed	daily	Per week	2/week

E. Do you dispose your dead birds

Bury	burn	Throwing in jungle	Mix with manure

F. What do you do to prevent disease

Medication	vaccination	quarantine	replacement	nothing

G. How would you treat a pox problem

Vet advice	p.vet advice	Herbal	Medicine from pharmacy	hawker	Nothing

H. How would you treat a mite problem

Vet advice	p. vet advice	Medicine from pharmacy	Remove by hand	hawker	Herbal	Nothing

J. Why do not use dewarming for your bird

unaware	costly	unavailability	Hard to admin	Other

K. Do you know any disease of poultry

ND	coccidiosis	pox	No idea	Other

L. Action taken when having sick birds (related to treatment)

Trt from VS	Trt from pvt	Herbal	Medicine from pharmacy	hawker	Quarantine

M. What do you do with your sick birds

treat	slaughter	disinfect	sell	Other

N. Do you know the poultry disease is harmful for people?

yes	no	No idea

MISCELLANEOUS

A. Fluctuation of chicken number in last five years

increased	decreased	Remained same

B. Months with highest number of chicken.....

C. Months with lowest number of chicken.....

