ADOPTION OF BROILER PRODUCTION PRACTICES BY THE FARMERS

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JUNE, 2017

ADOPTION OF BROILER PRODUCTION PRACTICES BY THE FARMERS

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REGISTRATION NO.: 11-04555

A Thesis

Submitted to the Faculty of Agriculture,

Sher-e-Bangla Agricultural University, Dhaka,

In Patial Fulfillment of the Requirements for the degree of

MASTER OF SCIENCE (MS)

IN

AGRICULTURAL EXTENSION

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CERTIFICATE

This is to certify that the thesis entitled **"ADOPTION OF BROILER PRODUCTION PRACTICES BY THE FARMERS"** submitted to the faculty of agriculture, Sher-e-Bangla Agricultural University, Dhaka-1207, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE in AGRICULTURAL EXTENSION**, embodies the result of a piece of bona fide research work carried out by **YEASIR ARAFAT**, Registration No. **11-04555** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

I further certify that such help or source of information, as has been available during the course of this investigation has duly been acknowledged.

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DADICATED TO

MY

BELOVED PARENTS AND

SUPERVISOR

ACKNOWLEDGEMENTS

All praises are due to Almighty Allah, the Great, Gracious and Merciful, Whose blessings enabled the author to complete this research work successfully. Guidance, help and co-operation have been received from several persons or authority during the tenure of the study, the author is grateful to them all who made a contribution to this research work. Although it is not possible to mention all by names it will be an act of ungratefulness if some names are not mentioned here for their immense contribution in the accomplishment of this study.

In particular, the author takes the opportunity to express his deepest sense of gratitude his honorable Supervisor **Prof. Dr. Md. Sekender Ali**, Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka for his continuous inspiration, valuable suggestions, constructive criticism, constant guidance and intensive supervision through the period of the study and preparation of this thesis without his intense co-operation this work would not have been possible.

The author deems proud privilege to extend his extreme gratefulness and best regards to his venerable Co-supervisor **Asso. Prof. Dr. Muhammad Humayun Kabir,** Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka for his keen interest, valuable advice, creative suggestions, co-operation and encouragement to bring this thesis up to its present standard.

The author would like to express his deepest respect and boundless gratitude especially to, **Asso. Prof. Md. Mahbubul Alam, Ph.D**., Chairman, Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka for his active help and moral support in pursuing the study.

The author deeply acknowledges the cooperation and sincere help of Upazila Livestock Officer, Boalmari. The author also expresses his heartfelt gratitude to the respondents of the study area who patiently provided the information during the interview with the

author.

The author expresses his grateful thanks to all staff and employees of the Department of Agricultural Extension and Information System, Sher-e-Bangla Agricultural University, Dhaka for their co-operation and encouragement to prepare this thesis.

The author also expresses heartfelt and sincere appreciations to all other departmental teachers of Sher-e-Bangla Agricultural University for their help and encouragement. Last but not least, the author expresses his deepest sense of gratitude, indebtedness and profound respect to his beloved parents, uncle, sisters, relatives and friends for their blessings, encouragement and moral support in all phases of this academic pursuit from beginning to the end.

The Author

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LIST OF ABBREVIATION AND GLOSSARY

Abbreviations	Full word
Ag. Ext. Ed	Agricultural Extension Education
Ag. Ext. and Info. Sys.	Agricultural Extension and Information System
ANOVA	Analysis of Variance
B	Multiple Regression
BBS	Bangladesh Bureau of Statistics
BCR	Benefit Cost Ratio
DLS	Department of Livestock Services
et al.	All Others
FAO	Food And Agriculture Organization
FCR	Feed Consumption Ratio
FSS	Farm Structure Survey
GDP	Gross Domestic Product
GOB	Government of Bangladesh
IAEA	The International Atomic Energy Agency
LC	Local Chicken
NAV	Net Asset Value
NGOs	Non-Government Organizations
OLS	Ordinary Least Squares
SAAO	Sub Assistant Agriculture Officer
SPSS	Statistical Package for Social Science
WYTEP	Women and Youth Training and Extension Project

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YEASIR ARAFAT

ABSTRACT

The objectives of the study were to assess the extent of adoption of broiler production practices by the farmers and to explore the contribution of the selected characteristics of the farmers to their adoption of broiler production practices. The study was conducted in nine villages of three unions of Boalmari upazila under Faridpur district. Data for this study were collected from 103 broiler farmers by using an interview schedule from 2 January, 2018 to 5 February, 2018. Descriptive statistics and stepwise multiple regression were used for analysis of the data. The findings revealed that about half (49.5%) of broiler farmers had high adoption compared to 22.3% and 28.2% had medium and low adoption of broiler production practices respectively. Among the influential variables, knowledge on broiler production alone contribute 92.2% of the variation where Feed Consumption Ratio (FCR), time spent and Benefit Cost Ratio (BCR) contribute 2.0%, 0.9% and 0.2% variation respectively to the adoption of broiler production practices by the farmers. Based on the findings, it is recommended that the policy makers should give emphasis to increase the knowledge of the broiler farmers so that they could spent more time to use good quality of broiler feed having high FCR, ultimately that yield high BCR in broiler production.

Key words: Broiler production, adoption, broiler production practices;

CHAPTER I
INTRODUCTION

1.1 Background of the Study

Agriculture is the backbone of the economy of Bangladesh. Agriculture contributes 21.84 percent demand for balanced diet. Poultry is one of the important segments of agriculture in Bangladesh. Broiler is one of the main products of poultry farming. About 2.58 percent of GDP came from animal farming during the 2010/11 financial year (MoF, 2012). In addition broiler is an excellent source of protein and nutrients which are essential for health and growth of the human body. About 50% children are born underweight and 52% mothers suffer from nutrition deficiency (BBS, 2014).

The poultry sector has emerged as a flourishing and promising commercial sector in Bangladesh during the recent years. The poultry sector registered as per holding increase of 38.8 percent and per capita increase of 64.8 percent for the period between 1983/84 and 2005 (Planning Commission, 2011). During the 2000/01-2008/09 decade poultry population registered a growth of over 5 percent. It is one of the fastest growing sectors with bright future and plays a crucial role in supplying nutritious food and generating income. It is recognized as a profitable business by many people and getting popularity day by day as employment opportunity is being among the people.

As a developing country, unemployment, inadequate nutrition, poverty and scarcity of arable land are the major problems in Bangladesh. The per capita intake of poultry meat in Bangladesh is only 11.2 grams per day (HIES, 2011) compared to a standard requirement of 36 grams per day (Ahmed and Islam 1985). Commercial broiler farming serves as ready source of income among the poor people when need money and creates the employment opportunity for educated

unemployed youth and also for women. It has been acting as an important tool for reducing the migration from rural poor people to the urban areas. Millions of rural women are involved in poultry rearing under the poverty alleviation program of direct Non-Government Organizations (NGOs) and Department of Livestock Services (DLS) under its packages program. The climate of Bangladesh is suitable for broiler farming, so the broiler birds can be raised easily to fulfill daily requirements of nutrient value. Broiler has shorter life cycle and its production requires less capital compared to other meat producing animals. The majority of the people irrespective of caste and religion prefer chicken. As a result, the prices of broiler have gone up over the years. Observing the situation of high price and demand in home market, a tendency to establish a small scale commercial farm has grown among people both in rural and urban areas. However, the number of poultry farm is not increasing as rapidly as it was expected because of many reasons.

1.2 Statement of the Problem

As a under developed country, poverty, unemployment and malnutrition are the major problems of Bangladesh. According to the Government estimation, the total number of educated but unemployed people in the country is about 3.6 million. The worst victims of malnutrition in the society are usually the children and mothers. In Bangladesh, about 50 percent children are born underweight and 55 percent children have stunted growth. About 83 percent of the children below the age of six suffer from anemia (GOB, 2012). In this situation, poultry rising appears to be a good way of mitigating the protein gap, employment generation and poverty alleviation in the shortest possible time. The financial benefits from poultry farming is also noteworthy, which in turn encourages the new investments in the poultry sector and therefore, poultry has become one of the most important emerging agro-industry in the country.

Very little is known about the adoption of selected modern broiler production practices by the broiler farmers in the country. Generalization from studies conducted home and abroad regarding the adoption of other practices may not be always applicable due to considerable variation in attributes of the practices and for various other factors.

For wider adoption of selected broiler production practices, it is necessary to have a clear understanding of the present status of adoption of selected broiler production practices by the broiler farmers. It is also necessary to have an understanding of the facts that contributed to adoption of selected broiler production practices. An understanding of the relationship of broiler farmers' adoption behavior with their selected characteristics as well as the problems faced by the respondents will be helpful to the planners and extension workers.

In view of the foregoing discussion, the researcher undertook a study entitled "adoption of broiler production practices by the farmers". The main purpose of the study was to have an understanding on the adoption of modern broiler production practices by the broiler farmers and about some selected factors contributing in the adoption of selected broiler production practices. For conducting the research in a planned and appropriate way, the researcher put forwarded the following questions:

i. What are the characteristics of broiler farmers?
ii. What is the extent of adoption of broiler production practices by the farmers?
iii. Is there any contribution of selected characteristics of the broiler farmers to their adoption of broiler production practices?

1.3 Objectives of the Study

The focal point of the research work was to explore the extent of adoption of broiler production practices by the farmers. This is why the following objectives were structured out in order to provide an appropriate track to the research work:

i. To describe some selected characteristics of the broiler farmers
   a. Age
   b. Educational qualification
   c. Experience in broiler production
   d. Family labour
   e. Amount of investment
   f. Credit receive
   g. Feed Consumption Ratio (FCR) from broiler production
   h. Benefit Cost Ratio (BCR) from broiler production
   i. Knowledge on broiler production
   j. Extension Contact
   k. Broiler production training exposure
   l. Time spent in broiler management

ii. To assess the extent of adoption of broiler production practices by the farmers

iii. To explore the contribution of the selected characteristics of the farmers to their adoption of broiler production practices

1.4 Scope of the Study

The main focus of the study was to determine the adoption of broiler production practices by the farmers. The findings of the study would be specifically applicable to Boalmari upazila in Faridpur district. However, the findings would also have implications for other areas of the country having relevance to the socio-cultural context of the study area. The investigator believes that the findings of the

study would reveal the phenomenon related to diffusion of innovation about the adoption of broiler production practices by the farmers. These would be special interest to the policy makers and planners in formulating and redesigning the extension programs especially for broiler production. The findings were expected to be helpful to the broiler farmers of different districts of Bangladesh and also different departments and organizations to develop appropriate extension strategies policies for effective working with the livestock and poultry specially broiler farmers.

1.5 Justification of the Study

The study expects to provide useful and important information to broiler producers, intermediaries, consumers and other concerned people of Bangladesh. The findings of the study are also expected to be helpful to the broiler farmers and traders for taking appropriate decision regarding further expansion of commercial broiler farming and production of live broiler.

The Government, policy makers, planners and other concerned agencies will get help to formulate development policies regarding more effective broiler farming in the country by using the information of the study. The results of this study will provided some basic information to policy maker, production economics specialists, and extension workers, enable them to formulate policies regarding effective production plan of broiler farming. The study will also provide information to the researchers, who are interested in conducting studies in future.

1.6 Assumptions of the Study

An assumption is the supposition that an apparent fact or principle is true in the light of available evidence (Goode and Hatt, 1952).The researcher had the following assumptions in his mind while undertaking this study:

i. The respondents included in the sample of the study were able to

provide their opinions and were competent enough to satisfy the queries.

ii. The information furnished by the respondents was reliable.

iii. The broiler production practices of broiler production included in the study were known to the respondents.

iv. The collected data from the respondents were free from bias.

v. Views and opinions furnished by the respondents included in the sample were the representative views and opinions of the whole population of the area concerned.

vi. The findings of the study would be useful for planning and execution of the programs in connection with diffusion production practices of broiler.

vii. The selected characteristics and the adoption of broiler production practices by the farmers of the study were normally and independently allotted with respective means and standard deviation.

1.7 Limitations of the Study

Considering the time, money and other necessary resources available to make the study manageable and meaningful, it was necessary to consider the following limitations:

i. The study was confined to only in Ghoshpur, Moyna and Satyour union of Boalmari upazila in Faridpur district. These three unions consisted of sixty two villages. Among the sixty two villages, only nine villages were selected purposefully for this study.

ii. There were many farmers under poultry production in the study area, but only the farmers who were involved in broiler production were considered for this study.

iii. Characteristics of the farmers were many and varied but only twelve (12) characteristics were selected for investigation in this study.

iv. During data collection the researcher had to depend on data furnished by the respondents. As none of the farmers kept records of their farming activities, they furnished information to the different questions by recall.

v. Conceptually, extent of adoption of the farmers were determined from their statements.

vi. Adoption of broiler production practices by the farmers could be measured in various ways. However in this study this was measured by using a rating scale.

vii. The present study highlights a new dimension of research in the field of agricultural extension in Bangladesh and so the researcher could not provide sufficient evidence in equipping his study report with relevant literature reviews.

1.8 Definition of Important Terms

Different terms used throughout the study are defined and interpreted below for clarity of understanding:

Adoption: It is the implementation of a decision to continue the use of an innovation. According to Rogers (1995), "adoption is a decision to make full use of an innovation as the best course of action available". When an individual takes up a new idea as the best course of action and practices it the phenomenon is known as adoption (Ray, 1991). In this study, adoption was defined as the phenomenon of taking up a new idea (i.e. broiler production technologies) and put it into practices by the broiler farmers of the study area.

Broiler: A broiler (*Gallus gallusdomesticus*) is any chicken that is bred and raised specifically for meat production.

Production: Production is a process of combining various material inputs and immaterial inputs (plans, know-how) in order to make something for consumption (the output). It is the act of creating output, a good or service which has value and contributes to the utility of individuals.

Practice: Practice is the actual application or use of an idea, belief, or method, as opposed to theories relating to it "the principles and practice of teaching". It's the synonyms of application, exercise, use, operation, implementation, execution, enactment, action, doing and more.

Broiler Farmers: The persons who were involved in farming activities are called farmers. They participated in different farm and community level activities like crops, livestock, fisheries, other farming activities etc. In this study, broiler producers were treated as farmers.

Age: Age of a respondent was defined as the period of time in actual years from his birth to the time of interviewing.

Education: Empirically it was defined to the development of desirable changes in knowledge, skill and attitudes in an individual through reading, writing, working, observation and other selected activities. However, in this study, it was measured on the basis of classes passed from a formal educational institution by the broiler farmers.

Experience in broiler production: Experience as a general concept comprises knowledge or skill of something or some event gained through involvement in or exposure to that thing or event. Experience refers to the nature of the events someone or something has undergone. Experience is what is happening to use all

the time-as long we exist. However, in this study, it was considered as the year of starting from first broiler production till the year of data collection.

Family labour: Family labour force of the agricultural holding in the context of the farm structure survey (FSS) refers to persons who carry out farm work on the holding and are classified either as a holder or the members of the sole holder's family.

Amount of Investment: Amount of investment is the cumulative cost of the mutual fund investment units we currently hold. Amount of Investment = Units x Purchase NAV (Net Asset Value). Current value is the current value of the mutual fund investment units we currently hold.

Feed Consumption Ratio (FCR): In animal husbandry, feed consumption ratio (FCR) or feed consumption rate is a ratio or rate measuring of the efficiency with which the bodies of livestock convert animal feed into the desired output. In some sectors, feed efficiency, which is the output divided by the input (i.e. the inverse of FCR), is used.

Benefit Cost Ratio (BCR): A benefit-cost ratio (BCR) is an indicator, used in cost-benefit analysis that attempts to summarize the overall value for money of a project or proposal. A BCR is the ratio of the benefits of a project or proposal, expressed in monetary terms, relative to its costs, also expressed in monetary terms.

Knowledge: Knowledge can refer to a theoretical or practical understanding of a subject. It can be implicit (as with practical skill or expertise) or explicit (as with the theoretical understanding of a subject); it can be more or less formal or systematic. It is a familiarity, awareness, or understanding of someone or

something, such as facts, information, descriptions, or skills, which is acquired through experience or education by perceiving, discovering, or learning.

Extension contact: It refers to the extent of contact with various communication media by the farmers in receiving agricultural information.

Training exposure: Training exposure referred to organized instruction aimed at improving knowledge, skill and attitude of respondents that they can perform his/her functions more effectively. Training experience referred to number of days the respondents received training in different aspects of agriculture.

Respondents: Randomly selected people considered to be representable of the population are known as respondents. They are the people from whom a social research worker usually gets most data required for his research. In this study the respondents were the village level broiler farmers.

Assumption: An assumption is "the supposition that an apparent fact or principle is true in the light of the available evidence" (Goode and Halt, 1952).

Hypothesis: Defined by Goode and Halt (1952), a proposition this can be put to "a test to determine its validity". It may be true or false, it may seem contrary to or in accord with common sense. However, it leads to an empirical test.

Null hypothesis: The hypothesis which we pick for statistical test is null hypothesis (H_0). In this study the null hypothesis is stated that there is no relationship between the concerned variables.

Research methodology: Research methodology is the description, explanation and justification of various methods of conducting research. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by a researcher in studying the research problem along with the logic behind them.

Statistical test: A body of rules which help to take decision regarding acception or rejection of the hypothesis is defined as test. In this study if a null hypothesis is rejected it is assumed that there is a relationship between the variables.

Variable: A general indication in statistical research of characteristic that occurs in a number of individuals, objects, groups etc. and that can take on various values, for example the age of an individual.

Extent of adoption: Ray (1991), defined extent of adoption as "the degree to which the farmer has actually adopted a practice".

CHAPTER II

REVIEW OF LITERATURE

In this chapter, review of literature related to the broiler production practices and some other improved technologies, information collected on this aspect from various sources such as theses, journals, articles, organization's reports etc. were presented into four sections:

Section 1: Broiler Production Scenario of Bangladesh

Section 2: Review of literature related to the Adoption of Broiler Production Practices by the Farmers in Different Aspects

Section 3: Relationship between the Selected Characteristics and Broiler Production Practices

Section 4: Conceptual Framework of the Study

2.1 Broiler Production Scenario of Bangladesh

History of broiler enterprise in Bangladesh is very recent. Commercial broiler chicks were not available in Bangladesh a few decades ago. In 1935, an improved variety of birds (White Leghorn) was first imported in India from foreign countries. Raising of improved type of birds was then started in the Government poultry farm. Later, people became interested in raising the chickens in their own houses after knowing about their better production capacity. In 1947, six poultry farms were first established in different places of Bangladesh for supplying eggs and chicks to the villagers. During this period, several small poultry farms were also established under village aid program for rural poultry development. In 1962-63, the Directorate of Livestock Services also started about 91 small poultry units in 91 upazilas with the objectives of supplying improved birds to the villagers.

In 1964, a commercial poultry farm named Eggs and Hens Ltd. was established at Gazipur near Dhaka city by late Mr. Ekramul Hossain, which was recognized as a mother commercial poultry farm in the private poultry sector (DLS, 2014). The Department of Poultry Science of former East Pakistan Agricultural University, (now Bangladesh Agricultural University, Mymensingh) brought day-old chicks from Pakistan and started producing broiler experimentally in the University Poultry Farm. In Bangladesh, poultry farming on commercial and scientific line was started in 1970. After the liberation of Bangladesh, BIMAN Bangladesh Airlines started a commercial poultry farm in the name of Biman Poultry Complex Ltd. at Savar, Dhaka. Its aim was mainly to supply meat for flight catering needs of the Biman Bangladesh Airlines, but it also fulfilled the demand for eggs and day-old chicks for private poultry farms. It reared 'Starbo' parent stock of Shaver Poultry Breeding Company of Canada. During late 1980s, the Department of Livestock Services (DLS), Bangladesh imported "Arbon Acrses" broiler parent stocks to increase meat production through popularizing commercial poultry in the country. DLS took program of distributing day-old chicks of commercial strains to farmers through its various regional and central poultry farms. Since then, commercial poultry started to gain popularity and during the 1990s, the poultry production started taking the shape of an industry with the establishment of a large number of small and large broiler and layer hatcheries.

2.2 Review of Literature Related to the Adoption of Broiler Production Practices by the Farmers in Different Aspects

The characteristics of the technology itself are also an important influence on farmers' technology adoption and usage decisions (Adesina and Zinnah, 1993).

Adoption is defined as the degree of use of a new technology in long run equilibrium when a farmer has full information about the new technology and it's potential (Grepprud, 2003).

A particular technology is adopted when the anticipated utility from it exceed that of non adoption (Douthwaite *et al.*, 2001).

According to Ochieng*et al.* (2011) rate and extent of adoption can be affected by various factors including farmer's age and education.

2.3 Relationship between the Selected Characteristics of the Farmers and Adoption of Broiler Production Practices

2.3.1 Age and adoption of various practices including broiler production

Teklewold, Dadi, & Dana (2006), pointed that farmers decision on the extent of adoption of exotic poultry breed was positively influenced by age of household head. They observed that farmers who were above 39 years were most likely to have lower adoption rates, because older people fear the risk of poultry diseases and other unexpected events in exotic breed of poultry whilst young farmers tend to be more flexible in their decisions to adopt new ideas and technologies more rapidly.

Nimje *et al.* (1993) observed that there was no significant relationship between age and adoption of management practices by poultry entrepreneurs.

Dipeolu *et al.* (1996) reported that the majority (55%) of the respondents were over 40 years of age i.e. old age followed by 34% and 11% belongs to 30-40 years age and 20-30 years age group, respectively on indigenous chicken rearing practices with adoption under village conditions .

Ahire *et al.* (2007) studied that majority of the member farmers of co-operative poultry society in Solapur district, India (44% and 35.33%) were from the age group of 36-45 and age group of up to 35 years, respectively. Majority of respondents belongs to medium age group and there was non-significant association between age and adoption of poultry farming.

According to Ochieng*et al.* (2011) production rate and extent of adoption can be affected by farmer's age of indigenous chicken production.

2.3.2 Education and adoption of various practices including broiler production

El-Osta and Morehart (2002) found that education was positively impacted the decision to adopt a management-intensive technology in dairy production.

Education has previously been found to have a positive association with the adoption of new technologies (Prokopy et al. 2008).

In agriculture, education is a key determinant of technology adoption and education levels are highly correlated with technology adoption rates (Olwande at al. 2009).

Ng eno (2011) pointed out that the level of education has significant and positive effect on adoption efficiency of poultry farmers. Farmers with more education were found to be more dynamic and therefore were more willing to adopt new technology practices compared to their counter-parts who were less educated.

Nimje *et al.* (1993) investigated that education and adoption of managemental practices were significantly associated with each other.

Ahire *et al.* (2007) found that there was significant relationship between education and adoption of management practices. Among the 90% of the educated farmers, most of them (42.66%) had received primary education, 32.67% of member farmers received higher secondary and above education, 14.675% received secondary education and one tenth farmers were illiterate.

Sashidhar *et al.* (2008) investigated that education and adoption was positively correlated with each other.

2.3.3 Experience in broiler production and adoption of various practices including broiler production

Ng eno (2011) pointed out that the experience has significant and positive effect on adoption efficiency of poultry farmers. Farmers with more years of experience was found to be more dynamic and therefore were more willing to adopt new technology practices.

Farming experience was negatively associated with adoption and use of AI (Artificial Insemination) technology (Kaaya et al, 2005).

Ahire *et al.* (2007) revealed that 42.67% of member poultry farmers had poultry keeping experience up to 10 years, 33.33% of the member farmers had experience between 11-20 years and nearly one fourth (24%) of the member farmers had experience in poultry keeping over 21 years and were significantly associated with adoption.

2.3.4 Family labour and adoption of various practices including broiler production

Feder and Umali (1993) found that family labour availability was significantly related to the adoption of agricultural innovation and practices.

2.3.5 Amount of investment and adoption of various practices including broiler production

The researcher didn't found any relationship between the amount of investment and adoption on broiler production and various practices.

2.3.6 Credit receive and adoption of various practices including broiler production

Feder and Umali (1993) found that access to credit was significantly related to the adoption of agricultural innovation and practices.

A recent study on adoption of chicken breeds in the highlands of Ethiopia indicated that adoption has been limited by a lack of credit (Tadelle *et al.*, 2003).

2.3.7 Feed Consumption Ratio (FCR) and adoption of various practices including broiler production

The researcher didn't found any relationship between the Feed Consumption Ratio (FCR) and adoption on broiler production and various practices.

2.3.8 Benefit Cost Ratio (BCR) and adoption of various practices including broiler production

Kumar and Rai (2006) studied on economic status of poultry farming enterprises in Andaman and Nicobar Islands. They revealed that the benefit cost ratio (BCR) on adoption for large, medium and small broiler farms was 1.24, 1.19 and 1.13 and for layers was 1.14, 1.10 and 1.03 respectively.

2.3.9 Knowledge on broiler production and adoption of various practices including broiler production

Talwar *et al.* (1990) studied knowledge level and consultancy pattern in adoption of poultry farming observed that 80.28% of respondent farmer knew the feeding practices followed by 75.66% who knowing about housing and other management practices. Only 66.57% farmers were having knowledge about diseases and its control.

Nimje *et al.* (1993) stated that two-thirds of poultry entrepreneurs (76.19%) were having high level of knowledge on adoption whereas about one-third of poultry entrepreneurs (21.42%) were had medium level of knowledge about poultry enterprise aspect. Only few (21.39%) had very low knowledge.

Kumar and Mahalati (1994) revealed that 74 percent of the respondents had high level of knowledge about adoption of poultry farming whereas 22 percent of respondents were in medium level of knowledge and only a few (4%) respondents

possessed very poor knowledge which may be attributed to the factors like ignorance in getting sufficient information and lack of conviction.

Narmatha *et al.* (1995) studied knowledge level of women on adoption of scientific poultry farming in Namakkal block of Tamil Nadu revealed that three-fourth (74%) of the poultry farm women possessed medium level knowledge, the rest had almost low (14%) or high (12%) level of knowledge.

2.3.10 Extension contact and adoption of various practices including broiler production

The role of extension contact media in the adoption of new technologies was positively related (Feder and Umali, 1993).

The social extension contacting network was significant relationship to adopt the new practices (Conley and Udry, 2010).

Hogset (2005) studied that social extension network had the expected positive and significant effect on the probability of SF adoption, shown that farmers with more peers were willing to adopt the practice.

2.3.11 Broiler production training exposure and adoption of various practices including broiler production

Ershad et al. (2004) conducted a study in Jessore district of Bangladesh observed that the overall production performance and net profit was found better in both of the trained farmers categories as compared to general farmers on adoption of the production performance of broilers .

2.3.12 Time spent in broiler management and adoption of various practices including broiler production

The researcher didn't found any relationship between the time spent and adoption on broiler production and various practices.

2.4 Conceptual Framework of the Study

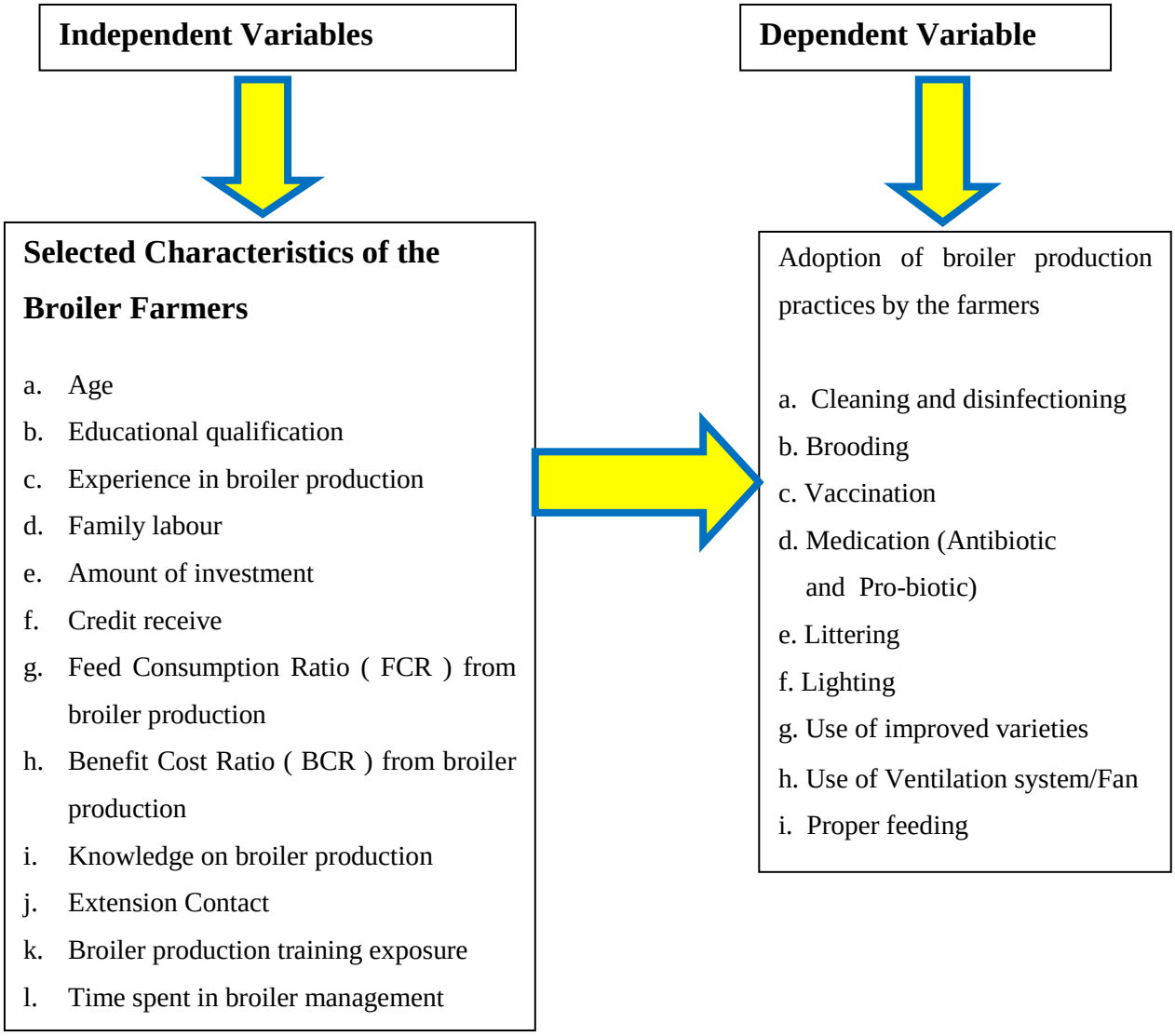

Figure 2.1 The Conceptual Framework of the Study

CHAPTER III

METHODOLOGY

Methodology deserves a very careful consideration in a scientific research. It is one of the most important parts before conducting a research work. To fulfill the objectives of the study, a researcher should be very careful while formulating methods and procedures in conducting the research. According to Mingers (2001), research method is a structured set of guidelines or activities to generate valid and reliable research results. The researcher has great responsibility to describe clearly as to what sorts of research design, methods and procedures he would follow in collecting valid and reliable data and to analyze and interpret those to arrive at correct summary and conclusion. Methodology of any study should be such as to enable the researcher to collect valid and reliable information to analyze the same properly and to arrive at appropriate decisions. Methods and procedures followed in conducting this study has been discussed in this chapter.

3.1 Locale of the Study

Selecting locale of the study is an important step for conducting a scientific study. It depends on the objectives of the research. Three unions namely Ghoshpur, Moina and Satyour of Boalmari upazila under Faridpur district were selected purposively as the locale of the study. Primary data was collected from nine (9) villages namely Chordoitorkathi, Gohailbari, Baliapara, Ratandia and Ghoshpur of Ghospur union; Gouripur and Madhuppur of Moina union; Kandakul and Satyour of Satyour union of Boalmari upazila under Faridpur district. Most of the broiler farmers are lived in these nine villages were considered as the locale of the study. A map of Bangladesh showing Faridpur district is shown in Figure 3.1 and a map of Faridpur district showing the study upazila (Boalmari) is shown in figure 3.2.

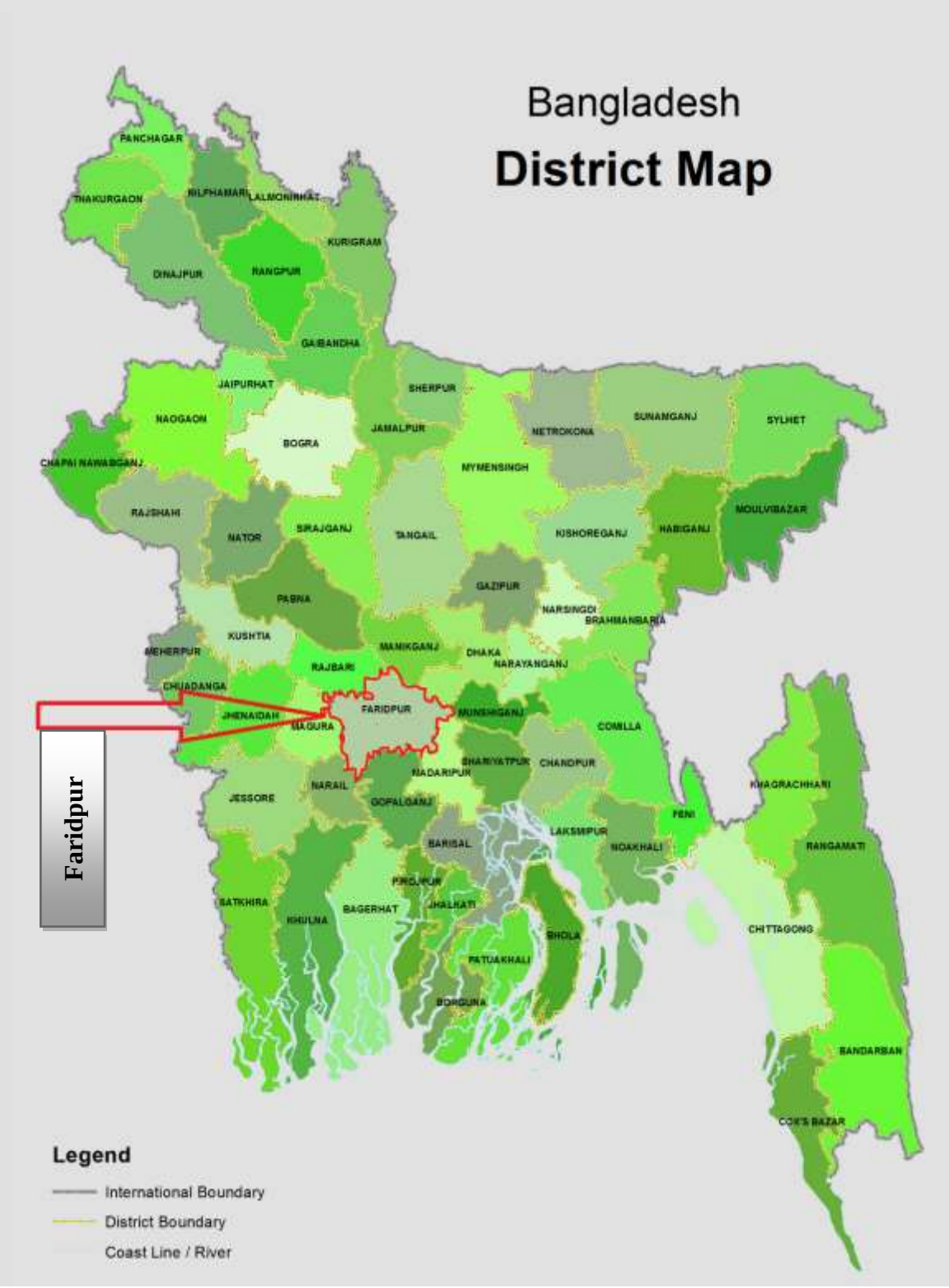

Figure 3.1 Map of Bangladesh showing Faridpur district

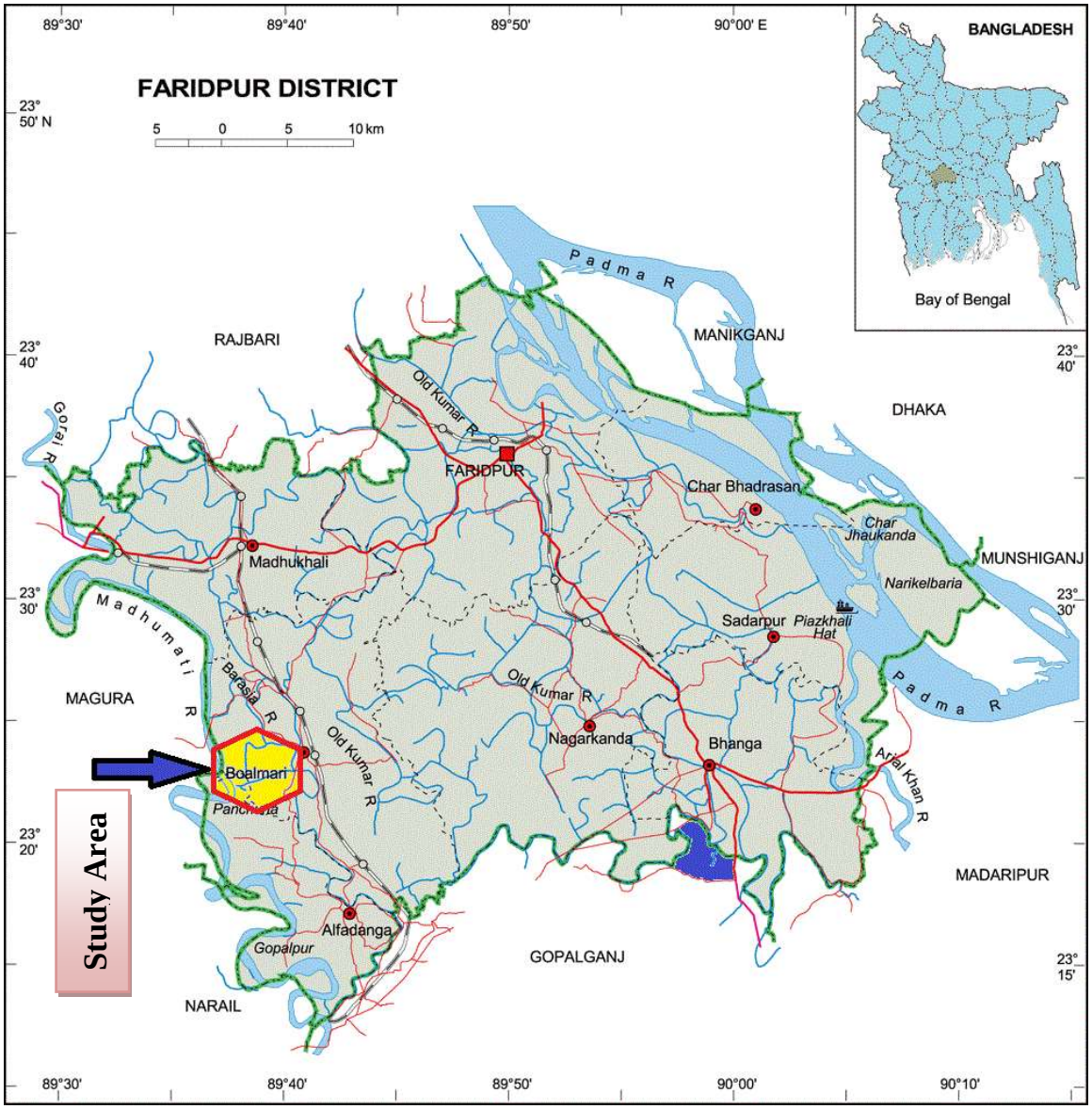

Figure 3.2 Map of Faridpur district showing the study upazila (Boalmari)

3.2 Population and Sample of the Study

People involved in broiler production in the selected villages were constituted the active population of this study. The Researcher himself with the help of local leaders, concerned Upazila Livestock Officer (ULO) and field agent prepared an updated list of all the broiler farmers of the selected villages. The total number of broiler farmers in these villages was 118 (28 from Satyour village, 23 from Ghoshpur village, 21 from Gohailbari village, 8 from Chordoitorkathi village, 6 from Baliapara village, 9 from Ratandia village, 9 from Kandakul village, 8 from Gouripur village and 6 from Madhuppur village). Boalmari upazila of Faridpur district which constituted the population of the study. As the population size was small, the total population of the study (i.e. 118) was considered as sample for the study except the number used in pilot survey.

3.3 Data Collection Instrument and Method

3.3.1 Instrument of data collection

In order to collect valid and reliable data from the broiler farmers, an interview schedule (questionnaire) both in Bengali and English version was designed keeping the objectives in mind. The Bengali version of interview schedule was multiplied as per requirements to collect data from the respondents. The English version of interview schedule has been enclosed in appendix-A. Simple and direct questions and different scales was used to obtain information. Both open and closed form questions was designed to obtain information relating to qualitative variable which was finally be measured by ranking score. The interview schedule was pre-tested with 15 sample respondents from the study area. Questions was asked systematically and explanations was made whenever it was necessary. The respondents were interviewed at their leisure time by using local language to the extent possible so that they can give accurate information in a cool mind. Data collection was started in 2nd January, 2018 and completed in 5th February, 2018.

3.3.2 Data collecting method

Data were collected through personal interviewing by the researcher himself. All possible efforts were made to establish rapport with the respondent so that they could feel easy and comfort to response the questions in the interview schedule. Necessary steps were taken to explain the purpose of the study to the respondents and their answers were recorded sincerely. If any respondent felt difficulty in understanding any question, care was taken to help him getting understood. The researcher did not face any serious problem in data collection. The data collection took 33 days from 2nd January to 5th February, 2018. The collected data were complied, tabulated and analyzed. Qualitative data were converted into quantitative form by means of suitable scoring whenever needed.

3.4 Variables and Their Measurement Techniques

In a descriptive social research, selection and measurement of the variable is an important task. A variable is any characteristics which can assume varying or different values are successive individuals' cases (Ezekiel and Fox, 1959). An organized research usually contains at least two identical elements i.e. independent and dependent variable. An independent variable is a factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon. A dependent variable is a factor which appears, disappears or varies as the experimenter introduces, removes or varies the independent variables (Townsend, 1953). According to the relevance of the research area, 12 characteristics of the respondents were selected as the independent variables (e.g. age, education, experience in broiler production, family labour, amount of investment, credit receive, Feed Consumption Ratio from broiler production, Benefit Cost Ratio from broiler production, Knowledge on broiler production, extension contact, broiler production training exposure, time spent in broiler management). On the other hand, adoption of broiler production practices was

dependent variable. The following sections contain procedures of measurement of dependent and independent variables of the study.

3.4.1 Measurement of independent variables

The selected characteristics of the respondent farmers constituted the independent variables of the study. To keep the research within the manageable sphere, 12 independent variables were selected for the study. The procedure followed in measuring the independent variables have been discussed in the subsequent sections.

3.4.1.1 Age

Age of the farmers was measured in terms of actual years from their birth to the time of the interview, which was found on the basis of the verbal response of the rural people (Azad, 2003). No fractional year was considered for the study. A score of one (1) was assigned for each year of one's age. This variable appears in item number one (1) in the interview schedule as presented in Appendix-A.

3.4.1.2 Education

Education of a respondent was measured in terms of years of schooling completed by an individual in educational institute. If a respondent did not how to read and write his literacy was taken as zero (0). A score of (0.5) was given to that respondent who could sign his name only. Besides a respondent got actual score of one (1) for every year of schooling i.e. '1' for class one, '2' for class two and soon. This variable appears in item number two (2) in the interview schedule as presented in Appendix-A.

3.4.1.3 Experience in broiler production

Broiler farming experience of the farmers was measured by the number of years a respondent engaged in broiler production. The measurement included from the

year of starting of first broiler production till the year of data collection. A score of one (1) was assigned for each year of experience. This variable appears in item number three (3) in the interview schedule as presented in Appendix-A.

3.4.1.4 Family labour

Family labour was estimated by computing the total number of member of a respondent's family, who engaged actively in broiler production activities. A score of '1' was assigned to each family labour and '2' for two family labours and so on. This variable appears in item number four (4) in the interview schedule as presented in Appendix-A.

3.4.1.5 Amount of investment

Amount of investment is the cumulative cost of the mutual fund investment units we currently hold. Amount of investment = Units x Purchase NAV (Net Asset Value). It was expressed in taka. However, a score of one (1) was assigned for each thousand (1000) taka of investment. This variable appears in item number five (5) in the interview schedule as presented in Appendix-A.

3.4.1.6 Credit receive

Amount of credit receive refers to the total financial credit received from different sources in one year. However, a score of one (1) was assigned for each thousand (1000) taka of credit. For an amount, less than Tk. 1000, a fraction score was computed and added with the main score. This variable appears in item number six (6) in the interview schedule as presented in Appendix-A.

3.4.1.7 Feed Consumption Ratio (FCR) from broiler production

In animal husbandry, Feed Consumption Ratio (FCR) is a ratio or rate measuring of the efficiency with which the bodies of livestock convert animal feed into the desired output. In some sectors, feed efficiency, which is the output divided by the

input (i.e. the inverse of FCR), is used. Here 1.6 rate is the standard ratio. It means, for 1 kg feed using, the farmer will get 600 gm body weight of broiler. This variable appears in item number seven (7) in the interview schedule as presented in Appendix-A.

3.4.1.8 Benefit Cost Ratio (BCR) from broiler production

A benefit-cost ratio (BCR) is an indicator, used in cost-benefit analysis, that attempts to summarize the overall value for money of a project or proposal. A BCR is the ratio of the benefits of a project or proposal, expressed in monetary terms, relative to its costs, also expressed in monetary terms. For an example, BCR 1.50 means for 1 taka spending, the farmer will get 0.50 taka benefit from broiler production. This variable appears in item number eight (8) in the interview schedule as presented in Appendix-A.

3.4.1.9 Knowledge on broiler production

Knowledge is defined in this study included those behaviours and test situations which emphasized the remembering either by recognition or recall of ideas, material or phenomenon (Bloom *et al*, 1956). This variable indicated the extent of knowledge the respondent possessed at the time of interview as evident from his responses to a set of questions related to broiler production practices. The respondents were asked to select appropriate answer from variety of possible answers. A score of '1' was given for each correct reply and '0' for incorrect reply for each item. The summation of scores for correct replies of all the 15 items of a particular respondent indicated his or her knowledge on broiler production. This variable appears in item number nine (9) in the interview schedule as presented in Appendix-A.

3.4.1.10 Extension contact

The extension contact with different communication media was computed for each respondent to determine the degree of his or her contact on the basis of his or her visit to the different communication media on different purposes. The following scale was used for computing the contact with different communication media's scores of the item:

Nature of visit	**Scores assigned**
Not at all	0
Rarely	1
Occasionally	2
Regularly	3

Logical frequencies were assigned to each four alternative nature of visit as indicated in the interview schedule. Finally, contact with different communication media score of a respondent was measured by adding all the scores obtained for all the 6 purposes. Thus score of a respondent could range from 0 to 18 while '0' indicating no contact with different communication media and '18' indicating very high contact with different communication media. This variable appears in item number ten (10) in the interview schedule as presented in Appendix-A.

3.4.1.11 Broiler production training exposure

Training exposure of a respondent was measured on the basis of number of days of training received from different sources in the last five years on broiler production. Training exposure score of a respondent was measured in terms of number of days for receiving training. For example, if a farmer received no training his/her score was zero (0) and score one (1) was assigned for receiving one day training. This variable appears in item number eleven (11) in the interview schedule as presented in Appendix-A.

3.4.1.12 Time spent in broiler management

Time spent in broiler management of the respondent was measured by the number of hours spent per day a respondent engaged in broiler production. A score of one (1) was assigned for each number of hour spent per day. This variable appears in item number twelve (12) in the interview schedule as presented in Appendix-A.

3.4.2 Measurement of dependent variable

Adoption of broiler production practices by the farmers was the dependent variable in this study. It was measured by using 5 point rating scale. The respondents were asked to indicate their adoption of recommended 9 broiler production practices.

The method of assigning scores to the five alternatives in each statement was as follows:

Extent of adoption	**Scores assigned**
Very High adoption	5
High adoption	4
Moderate adoption	3
Low adoption	2
Very low adoption	1

The extent of adoption scores of a respondent was measured by adding the score of all the 9 broiler production practices as shown in item number 13 of the Interview schedule as presented in Appendix-A. Thus the extent of adoption scores of a respondent could range from 9 to 45, where '9' indicating very low adoption of broiler production practices and '45' indicate highest adoption of broiler production practices.

3.5 Hypothesis of the Study

According to Kerlinger (1973) a hypothesis is a conjectural statement of the relation between two or more variables. Hypothesis are always in declarative sentence form and they are related, either generally or specifically from variables to variables. In broad sense hypotheses are divided into two categories: (a) Research hypothesis and (b) Null hypothesis.

3.5.1 Research hypothesis

Based on review of literature and development of conceptual framework, the following research hypothesis was formulated:

"Each of the twelve (12) selected characteristics (age, education, experience in broiler production, family labour, amount of investment, credit receive, Feed Consumption Ratio from broiler production, Benefit Cost Ratio from broiler production, Knowledge on broiler production, extension contact, broiler production training exposure, time spent in broiler management) has significant relationship to adoption of broiler production practices". However, when a researcher tries to perform statistical tests, then it becomes necessary to formulate null hypothesis.

3.5.2 Null hypothesis

A null hypothesis states that there is no contribution between the concerned variables. The following null hypothesis was formulated to explore the contribution of the selected characteristics of farmers on their adoption of broiler production practices. Hence, in order to conduct tests, the earlier research hypothesis was converted into null form as follows:

"There is no contribution of the selected characteristics (age, education, experience in broiler production, family labour, amount of investment, credit receive, Feed Consumption Ratio from broiler production, Benefit Cost Ratio from

broiler production, Knowledge on broiler production, extension contact, broiler production training exposure, time spent in broiler management) of farmers on their adoption of broiler production practices".

3.6 Data Processing

After completion of field survey, all the data were coded, compiled and tabulated according to the objectives of the study. Local units were converted into standard units. All the individual responses to questions of the interview schedule were transferred into a master sheet to facilitate tabulation, categorization and organization. In case of qualitative data, appropriate scoring technique was followed to convert the data into quantitative form.

3.7 Statistical Analysis

The data were analyzed in accordance with the objectives of the proposed research work. Qualitative data were converted into quantitative data by means of suitable scoring technique wherever necessary. The statistical measures such as range, means, standard deviation, number and percentage distribution were used to describe the variables. The analysis of data was performed using statistical treatment with SPSS (Statistical Package for Social Science) computer program, version 20. Regression analysis was used to identify the linear combination between independent variables used collectively to predict the dependent variable (Miles and Shevlin, 2001). Regression analysis helps us understand how the typical value of the dependent variable changes when one of the independent variables varied. Ordinary Least Squares (OLS) is used most extensively for estimation of regression functions. In short, the method choose a regression where the sum of residuals, $\sum$ Ui is as small as possible (Gujarati, 1995). As shown in the following equation, explanatory variable included in model consist of those measuring various asset endowment and demographic characteristics of farmers.

In order to estimate the contribution of the selected characteristics of broiler farmers to the adoption of broiler production practices by them, multiple regression analysis (B) was used. Throughout the study, five (0.05) percent and one (0.01) percent level of significance were used as the basis for rejecting any null hypothesis. If the computed value of (B) was equal to or greater than the designated level of significance (*p*), the null hypothesis was rejected and it was concluded that there was a significant contribution between the concerned variable. Whenever the computed value of (B) was found to be similar at the designated level of significance (*p*), the null hypothesis could not be rejected. It was concluded that there was no contribution of the concerned variables.

The model used for this analysis can be explained as follows:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + b_9x_9 + b_{10}x_{10} + b_{11}x_{11} + b_{12}x_{12} + e$$

Where, Y = Adoption of broiler production practices;

Of the independent variables, x_1 is the broiler farmers age, x_2 is educational qualification, x_3 is experience in broiler production, x_4 is family labour, x_5 is amount of investment, x_6 is credit receive, x_7 is Feed Consumption Ratio (FCR) from broiler production, x_8 is Benefit Cost Ratio (BCR) from broiler production, x_9 is knowledge on broiler production, x_{10} is extension contact, x_{11} is broiler production training exposure and x_{12} is time spent in broiler management. On the other hand, $b1_,$ b_2, b_3, b_4, b_5, b_6, b_7, b_8, b_9, b_{10}, b_{11} and b_{12} are regression coefficients of the corresponding independent variables, and e is random error, which is normally and independently distributed with zero mean and constant variance.

CHAPTER IV

RESULTS AND DISCUSSION

A consequential and detailed discussion on the findings of the scientific research study has been presented in this chapter. The chapter includes three sections. In the first section, independent variables i.e. characteristics of the respondents have been discussed. The second section dealt with dependent variable i.e., Adoption of broiler production practices by the farmers and finally, the relationship between the dependent and independent variables have been discussed in the third section.

4.1 Selected Characteristics of the Broiler Farmers

Twelve characteristics of the broiler farmers were selected to describe and to find out their relationships with their adoption of broiler production practices. These selected characteristics were age, education, experience in broiler production, family labour, amount of investment, credit receive, Feed Consumption Ratio from broiler production, Benefit Cost Ratio from broiler production, Knowledge on broiler production, extension contact, broiler production training exposure, time spent in broiler management confronted in adoption of broiler production practices. The noticeable topographic of the 12 characteristics of the broiler producing farmers, each of which constituted an independent variable.

4.1.1 Age

The age of the sample farmers ranged from 25 to 80 years with a mean of 40.35 and standard deviation of 10.67. The respondents were classified into three categories on the basis of their age (Table 4.1) following Rashid *et al.* (2014).

Table 4.1 Distribution of the broiler farmers according to their age

Categories	Scoring	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
Young	Up to 35	25-80	39	37.9	40.35	10.67
Middle	36-50		47	45.6		
Old	Above 50		17	16.5		
Total			103	100.0		

Data showing that the highest value of proportion 45.6 % of the broiler farmers were middle aged compared to 37.9 % were young and 16.5% were old aged. Data also indicates that the middle and young aged category constitute 83.5 percent of total farmers. According to Lionberger (1960) elderly farmers seem to be somewhat less motivated to adopt new farm practices than younger ones. Young and middle aged people generally show more favorable attitude towards trying new ideas than the older. The extension agents can target those people in designing their extension activities.

4.1.2 Education

The education score of the farmers ranged from 0-16, with a mean of 6.89 and standard deviation of 4.32. The respondents were classified into five categories on the basis of their education as shown in Table 4.2.

Table 4.2 Distribution of the farmers according to their education

Categories	Scoring	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
Illiterate	0-0.5	0-16	15	14.6	6.89	4.32
Primary education	1–5		34	26.2		
Secondary education	6–10		46	44.6		
Above secondary education	> 10		15	14.6		
Total			103	100.0		

It is determined from the Table 4.2 that 44.6% of the respondents comprised of secondary education, 26.2% comprised of primary education, 14.6 % had above secondary education, and 14.6 % were illiterate. Table 4.2 also showed that 70.8 percent out of the selected respondents got primary to secondary level of education.

4.1.3 Experience in broiler production

The score of experience in broiler production by the farmers ranged from 1 to 12 years with a mean and standard deviation of 3.95 and 2.23, respectively. The respondents were classified into three categories on the basis of their experience (Table 4.3) following.

Table 4.3 Distribution of the broiler farmers according to their experience

Categories	Scoring	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
Low	Up to 4	1-12	65	63.1	3.95	2.23
Medium	5-8		34	33.0		
High	Above 8		4	3.9		
Total			103	100.0		

Table 4.3 indicates that the farmers belonged to low experience in broiler production category constituted the highest proportion (63.1%) followed by medium experience (33%) and high experience (3.9%). The results indicate that the famers experience in broiler production was low to medium. Higher experiences would help the farmers to adopt improved practices in broiler production. So the necessary technical support should be provided to the low and medium experienced broiler farmers for increasing their knowledge on adoption of broiler production practices.

4.1.4 Family labour

The family labour of the respondents under this study ranged from 2- 4, with an average of 2.35 and standard deviation of 0.58. The respondents were classified into three categories on the basis of their family labour (Table 4.4) following.

Table 4.4 Distribution of the broiler farmers according to their family labour

Categories	Scoring	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
Low	2	2-4	72	69.9	2.35	0.58
Medium	3		26	25.2		
High	4		5	4.9		
Total			103	100.0		

Data presented in the Table 4.4 indicates that majority (69.9%) of the respondents' family had low family labour compared to 25.2 percent medium and 4.91 percent high family labour. The findings of the study revealed that overwhelming majority (95.1 %) of the farmers had low to medium family labour. Low family labour can educate their children properly and can enjoy other social amenities. However, high family labour can handle work easily by dividing the work among them.

4.1.5 Amount of investment

The amount of investment of the sample farmers ranged from 100 to 1000 with a mean of 393.01 and standard deviation of 198.414. The respondents were classified into three categories on the basis of their amount of investment (Table 4.5) following.

Table 4.5 Distribution of the farmers according to their amount of investment

Categories	Scoring	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
Low <Mean-0.5sd	Up to 293.81	100-1000	31	30.1	393.01	198.41
Medium Mean±0.5sd	293.82-492.22		35	34.0		
High >Mean+0.5sd	Above 492.22		37	35.9		
Total			103	100.0		

Table 4.5 indicates that the farmers belonged to high investment in broiler production category constituted the highest proportion (35.9%) followed by medium investment (34.0%) and low investment (30.1%). The results indicate that the famers investment in broiler production was medium to high (69.9%)amount of investment. The high investment would help the farmers to adopt improved practices in broiler production. So the necessary technical support should be provided to the low and medium invested broiler farmers for increasing their investment on adoption of broiler production practices.

4.1.6 Credit receive

The credit receive of the sample farmers ranged from 0 to 150 with a mean of 50.15 and standard deviation of 47.612. In case of this characteristic, the respondents were classified into four categories on the basis of their observed range (Table 4.6).

Table 4.6 Distribution of the farmers according to their credit receive

Categories	Scoring	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
No	0	0-150	39	37.9	50.15	47.612
Low	Up to 50		25	24.2		
Medium	>50-100		33	32.1		
High	Above 100		6	5.8		
Total			103	100.0		

Table 4.6 indicates that the farmers belonged to no credit receive in broiler production category constituted the highest proportion (37.9%) followed by medium credit (32.1%), low credit (24.2%) and high credit (5.8%) . The results indicate that most of the famers credit receive in broiler production was low to medium (56.3%) credit receive. The high credit receive would help the farmers to adopt improved practices in broiler production. So the necessary technical support should be provided to the no credit receive broiler farmers for increasing their credit receive on adoption of broiler production practices.

4.1.7 Feed Consumption Ratio (FCR)

Feed Consumption Ratio (FCR) on broiler production scores of the farmers observed ranged from 1.10 to 1.75 with a mean of 1.47 and standard deviation of 0.18. The respondents were classified into three categories on the basis of their FCR (Table 4.7) following.

Table 4.7 Distribution of the broiler farmers according to their FCR

Categories	Scoring	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
Low (< Mean-0.5Sd)	Up to 1.28	1.10-1.75	24	23.3	1.47	0.18
Medium (Mean±0.5Sd)	1.29-1.65		69	67.0		
High (> Mean+0.5Sd)	Above 1.65		10	9.7		
Total			103	100.0		

Data in the Table 4.7 show that the highest proportion (67.0%) of the respondents had the medium FCR, 23.3 percent had low FCR and 9.7 percent respondents had high FCR on broiler production. The results indicate that most of the famers FCR in broiler production was low to medium (90.3%) FCR on broiler production. So for getting more broiler production, the farmers have to increase the Feed Consumption Ratio (FCR) on broiler production.

4.1.8 Benefit Cost Ratio (BCR)

Benefit Cost Ratio (BCR)on broiler production scores of the farmers observed ranged from 0.88 to 1.89 with a mean of 1.38 and standard deviation of 0.30. The respondents were classified into three categories on the basis of their FCR (Table 4.8) following.

Table 4.8 Distribution of the broiler farmers according to their BCR

Categories	Scoring	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
Low (< Mean-Sd)	< 1.08	0.88-1.89	23	22.3	1.38	0.30
Medium (Mean±Sd)	1.08-1.68		59	57.3		
High (> Mean+Sd)	> 1.68		21	20.4		
Total			103	100.0		

Data in the Table 4.8 show that the highest proportion (57.3%) of the respondents had the medium BCR, 22.3 percent had low BCR and 20.4 percent respondents had high BCR on broiler production. The results indicate that most of the famers BCR in broiler production was low to medium (79.6%) BCR on broiler production. So for getting more broiler production, the farmers have to increase the Benefit Cost Ratio (BCR) on broiler production.

4.1.9 Knowledge on broiler production

Knowledge on broiler production scores of the farmers observed ranged from 7 to 15 with a mean of 12.07 and standard deviation of 2.25. On the basis of knowledge on broiler production scores, the respondents were classified into three categories on the basis of observed range Table 4.9.

Table 4.9 Distribution of the broiler farmers according to their knowledge

Categories	Scoring	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
Low	Up to 9	7-15	19	18.6	12.07	2.25
Medium	10-12		28	27.2		
High	Above 12		56	54.4		
Total			103	100.0		

Data in the Table 4.9 show that the highest proportion (54.4 %) of the respondents had the high knowledge, 27.2 percent had medium knowledge and 18.6 percent respondents had low knowledge on broiler production. The results indicate that most of the famers knowledge on broiler production was medium to high (81.6%) knowledge on broiler production. So, for getting more broiler production, the DLS have to increase the farmers knowledge on broiler production by giving proper training.

4.1.10 Extension contact

The computed extension contact scores of the respondents ranged from 5 to 16 with a mean of 10.70 and standard deviation of 1.95 against the possible range of 0 to16. On the basis of extension contact on broiler production scores, In case of this characteristic, the respondents were classified into three categories on the basis of their observed range (Table 4.10).

Table 4.10 Distribution of the farmers according to their extension contact

Categories	Scoring	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
Low	Up to 8	5-16	15	14.6	10.70	1.95
Medium	9-12		71	68.9		
High	Above 12		17	16.5		
Total			103	100.0		

Data presented in Table 4.10 indicated that the highest proportion (68.9%) of the farmers of the study area had medium extension contact, while 16.5 percent had high and 14.6 percent had low extension contact. The results indicate that most of the famers extension contact on broiler production was medium to high (85.4%) on broiler production. So, for getting more broiler production, the DLS have to increase the farmers extension contact on broiler production by arranging farmers day, fair and by giving proper training to the farmers.

4.1.11. Training exposure

The observed range about training exposure was from 0 to 15 with a mean and standard deviation of 3.79 and 3.64 respectively. According to their length of training score, the respondents were classified into three categories based on observed range. The distribution of the respondents according to their training exposure has been presented in Table 4.11.

Table 4.11 Distribution of the farmers according to their training exposure

Categories	Scoring	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
No	0	0-15	29	28.2	3.79	3.64
Low	Up to 5		47	45.6		
Medium	6-10		23	22.3		
High	>10		4	3.9		
Total			103	100		

The Table 4.11 showed that the percentage of no training, low training, medium training and high training were 28.2%, 45.6%, 22.3% and 3.9% respectively. Table 4.11 shown that 28.2% of total farmers had no training exposure, while 45.6% and 22.3% farmers had low and medium training exposure respectively. Farmers of no to low training exposure (73.8%) were very high compared to medium and high category. Training makes the farmers skilled and helps them to acquire deep knowledge about the respected aspects. Trained farmers can better tackle any kind of challenges about the adverse situation in their broiler production. So, the broiler farmers have to give proper training on various aspects of broiler production practices.

4.1.12 Time spent

Time spent on broiler production scores of the farmers observed ranged from 8 to 15 with a mean of 12.62 and standard deviation of 2.59. On the basis of time

spend on broiler production scores, the respondents were classified into three categories that were shown in Table 4.12.

Table 4.12 Distribution of the broiler farmers according to their time spent

Categories	Scoring	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
Low (Mean-Sd)	Up to 10	8-15	30	29.1	12.62	2.59
Medium (Mean±Sd)	11-14		46	44.7		
High (Mean+Sd)	Above 14		27	26.2		
Total			103	100.0		

Data in the Table 4.12 show that the highest proportion (44.7%) of the respondents had the medium time spent, 29.1 percent had low time spend and 26.2 percent respondents had high time spent on broiler production. The results indicate that most of the famers time spent on broiler production was low to medium (73.8%) time spent on broiler production. So for getting more broiler production, the DLS have to inspire the farmers to give more time on broiler production by giving proper information training and other services.

4.2 Adoption of broiler production practices

The observed range of adoption on broiler production practices scores of the farmers was 18 to 42 against the possible range of 9-45 with a mean of 31.81 and standard deviation of 7.61. On the basis of adoption on broiler production scores, the respondents were classified into three categories as shown in Table 4.13.

Table 4.13 Distribution of the broiler farmers according to their adoption

Categories	Basis of categorization (Score)	Observed Range	Respondents		Mean	SD
			Number	Percent (%)		
Low adoption	<Mean-SD i.e. Up to 24	18-42	29	28.2	31.81	7.61
Medium adoption	Mean±SD i.e. 25-38		23	22.3		
High adoption	>Mean+SD i.e. Above 38		51	49.5		
Total			103	100.0		

Data in the Table 4.13 show that the highest proportion (49.5 %) of the respondents had the high adoption, 28.2 percent had low adoption and 22.3 percent respondents had medium adoption on broiler production practices. The high adoption of the broiler farmers enhance their inspiration to go forward for higher broiler production. Besides, the DLS have to take the proper policy for increasing the adoption of broiler production practices by the farmers.

4.3 Contribution of Selected Characteristics of the Farmers to Their Adoption of Broiler Production Practices

For this study 12 characteristics of the respondents were selected and each of the characteristics was treated as independent variable. Of the independent variables, x_1 is the broiler farmers age, x_2 is educational level, x_3 is experience, x_4 is family labour, x_5 is amount of investment, x_6 is credit receive, x_7 is Feed Consumption Ratio (FCR), x_8 is Benefit Cost Ratio (BCR), x_9 is knowledge on broiler production, x_{10} is extension contact, x_{11} is training exposure, x_{12} is time spent in broiler production. Y= is the adoption of broiler production practices by the farmers as dependent variable of the study.

Full model regression was initially run with the 12 independent variables. But it was observed that the full model regression results were misleading due to existence of interrelationships among the independent variables. Therefore, in

order to avoid the misleading results and to determine the best explanatory variables, the method of stepwise multiple regression was administrated and 12 independent variables were fitted together in stepwise multiple regression analysis. Table 4.14 shows the summarized results of stepwise multiple regression analysis with 12 independent variables on adoption of broiler production practices by the farmers. It was observed that out of 12 variables only 4 independent variables namely Feed Consumption Ratio (FCR) (x_7), Benefit Cost Ratio (BCR) (x_8), knowledge on broiler production (x_9) and time spent (x_{12}) were entered into the regression equation on broiler production. The regression equation is so obtained below:

$$\mathbf{Y = 39.134 + 0.326X_9 + 0.340X_7 + 0.182X_{12} + 0.034X_8}$$

Table 4.14 Summary of stepwise multiple regression analysis showing the contribution of selected characteristics of the broiler farmers to the adoption of broiler production practices by the farmers

Variables entered	Standardized Partial 'b' Coefficients	Value of 't' (with probability level)	Adjusted R^2	Increase in R^2	Variation explained in percent
Knowledge (x_9)	0.326	3.606 (0.001)	0.922	0.922	92.2
Feed Consumption Ratio (FCR) (x_7)	0.340	4.735 (0.000)	0.942	0.020	2.0
Time spent (x_{12})	0.182	3.080 (0.003)	0.951	0.009	0.9
Benefit Cost Ratio (BCR) (x_8)	0.034	0.413 (0.012)	0.953	0.002	0.2
Total				0.953	95.3

Multiple R=0.961; R-square= 0.923

Adjusted R-square= 0.922 ;F-ratio= 1208.322

Standard error estimation= 2.124; Constant= 3.254

The multiple R and R^2 values were found 0.961 and 0.923 respectively and the corresponding F-ratio was 1208.322 which were significant at 0.000 levels. For determining unique contribution of each of the four variables the increase in R^2 value was determined on adoption of broiler production practices by the farmers. These four variables combinedly explained 95.3 percent of the total variation to the adoption of broiler production practices by the farmers. Knowledge on broiler production alone contribute 92.2 percent where Feed Consumption Ratio (FCR) in broiler production (2%), time spent (0.9%) and Benefit Cost Ratio (BCR) (0.2%) had rest of variation to the adoption of broiler production practices by the farmers.

4.3.1 Contribution of knowledge on broiler production to the adoption of broiler production practices by the farmers

The contribution of knowledge on broiler production to the broiler production practices by the farmers was measured by testing the following null hypothesis:

"There is no contribution of knowledge on broiler production to the adoption of broiler production practices by the farmers".

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

a. The contribution of knowledge on broiler production was 92.2 percent.

b. It was the highest contribution to the adoption of broiler production practices by the farmers.

c. The null hypothesis could be rejected.

Based on the above finding, it can be stated that a respondent's knowledge on broiler production had an important effect on adoption of broiler production practices by the farmers. Knowledge on broiler production enhances the abilities

of the respondents at a short time than others which transformed them to adopt the broiler production practices by the farmers.

4.3.2 Contribution of Feed Consumption Ratio (FCR) in broiler production to the adoption of broiler production practices by the farmers

The contribution of Feed Consumption Ratio (FCR) in broiler production to the broiler production practices by the farmers was measured by testing the following null hypothesis:

"There is no contribution of Feed Consumption Ratio (FCR) in broiler production to the adoption of broiler production practices by the farmers".

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

a. The contribution of Feed Consumption Ratio (FCR) in broiler production was 2.0 percent.

b. It was the important contribution to the adoption of broiler production practices by the farmers.

c. The null hypothesis could be rejected.

Based on the above finding, it can be stated that a respondents Feed Consumption Ratio (FCR) in broiler production had an important effect on adoption of broiler production practices by the farmers. Feed Consumption Ratio (FCR) in broiler production enhances the abilities of the respondents at a short time than others which transformed them to adopt the broiler production practices by the farmers.

4.3.3 Contribution of time spent in broiler production to the adoption of broiler production practices by the farmers

The contribution of time spent in broiler production to the broiler production practices by the farmers was measured by testing the following null hypothesis:

“There is no contribution of time spent in broiler production to the adoption of broiler production practices by the farmers”.

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

a. The contribution of time spent in broiler production was 0.9 percent.

b. It was the important contribution to the adoption of broiler production practices by the farmers.

c. The null hypothesis could be rejected.

Based on the above finding, it can be stated that a respondent’s time spent in broiler production had an important effect on adoption of broiler production practices by the farmers. Time spent in broiler production enhances the abilities of the respondents at a short time than others which transformed them to adopt the broiler production practices by the farmers.

4.3.4 Contribution of Benefit Cost Ratio (BCR) in broiler production to the adoption of broiler production practices by the farmers

The contribution of Benefit Cost Ratio (BCR) in broiler production to the broiler production practices by the farmers was measured by testing the following null hypothesis:

“There is no contribution of Benefit Cost Ratio (BCR) in broiler production to the adoption of broiler production practices by the farmers”.

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

a. The contribution of Benefit Cost Ratio (BCR) in broiler production was 0.2 percent.

b. It was the important contribution to the adoption of broiler production practices by the farmers.

c. The null hypothesis could be rejected.

Based on the above finding, it can be stated that a respondent's Benefit Cost Ratio (BCR) in broiler production had an important effect on adoption of broiler production practices by the farmers. Benefit Cost Ratio (BCR) in broiler production enhances the abilities of the respondents at a short time than others which transformed them to adopt the broiler production practices by the farmers.

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

The study was conducted in the Boalmari upazila in Faridpur district to find out the adoption of broiler production practices by the farmers. Total 103 broiler farmers were selected from the study area as the population and the respondents comprised of 103 broiler farmers constituted the sample of the study. A well structured interview schedule was developed based on objectives of the study for collecting data. The independent variables were: age, education, experience in broiler production, family labour, amount of investment, credit receive, Feed Consumption Ratio (FCR), Benefit Cost Ratio (BCR), knowledge on broiler production, extension contact, training exposure and time spent in broiler production. Data collection was started in 2 January, 2018 and completed in 4 February, 2018. Various statistical measures such as frequency counts, percentage distribution, average and standard deviation were used in describing data. In order to estimate the contribution of the selected characteristics of broiler farmers to their adoption of broiler production practices by the farmers, multiple regression analysis (B) was used. The major findings of the study are summarized below:

5.1 Major Findings

5.1.1 Selected characteristics of the broiler farmers

Age: The middle-aged broiler farmers comprised the highest proportion (45.6%) and lowest proportion by old aged category (16.5%).

Education: Secondary education constituted the highest proportion (44.6%) and the lowest 7.8 percent was illiterate.

Experience: Low experience constituted the highest proportion (63.1%) and high experience constituted the lowest proportion (3.9%).

Family labour: Low category family labour comprised the highest proportion (69.9%) and high category family labour constituted the lowest proportion (4.9%).

Amount of investment: The highest amount of investment constituted the highest proportion (35.9%), while the lowest proportion in low amount of investment constituted with 30.1 percent farmers.

Credit receive: The broiler farmers having no credit amount of credit receive constituted with 37.9 percent farmers as the highest proportion, while the lowest proportion in high amount of credit receive was only 5.8 percent farmers.

Feed Consumption Ratio (FCR): The medium FCR constituted the highest proportion (67.0%), while the lowest proportion was high FCR 9.7 percent.

Benefit Cost Ratio (BCR): The highest proportion was the medium BCR (57.3%), while the lowest proportion was the high BCR 20.4 percent.

Knowledge on broiler production: The highest proportion (54.4%) of the broiler farmers had high knowledge on broiler production compared to the lowest proportion (18.6%) had low knowledge of the farmers.

Extension contact: The highest proportion (68.9%) of the farmers had medium extension contact as compared to 14.6 percent of them having low extension contact category.

Training exposure: The highest proportion (59.2%) of the broiler farmers had low training exposure and 12.6 percent had medium training exposure category.

Time spent: The highest proportion (44.7%) of the broiler farmers had medium time spent compared to 26.2 percent in high time spent.

5.1.2 Adoption of broiler production practices by the farmers

The highest 49.5 percent of the broiler farmers belong to the group of high adoption category and the lowest percentage 22.3 percent in medium adoption category of broiler production practices.

5.1.3 Contribution of selected characteristics of the farmers to their adoption of broiler production practices

The multiple R and R^2 values were found 0.961 and 0.923 respectively and the corresponding F-ratio was 1208.322 which were significant at 0.000 levels. For determining unique contribution of each of the four variables the increase in R^2 value was determined on adoption of broiler production practices by the farmers. These four variables combinedly explained 95.3 percent of the total variation to the adoption of broiler production practices by the farmers. Knowledge on broiler production alone contribute 92.2 percent where Feed Consumption Ratio (FCR) in broiler production (2%), time spent (0.9%) and Benefit Cost Ratio (BCR) (0.2%) had rest of variation to the adoption of broiler production practices by the farmers.

5.2 Conclusions

The findings and relevant facts of research work prompted the researcher to draw following conclusions.

i. Half of the broiler farmers were in low to medium adoption category. Therefore, broiler production practices by the farmers need to maximize by using broiler production practices.

ii. Knowledge on broiler production of the farmers had influenced in increasing the adoption of broiler production practices. Therefore, in order to increase adoption of broiler production practices, steps should be taken to increase knowledge of broiler farmers.

iii. Feed Consumption Ratio (FCR) had significant effect to the adoption of broiler production practices by the farmers. So, the government should keep the feed cost as minimum as possible and supply to the broiler farmers for adoption of broiler production practices.

iv. Time spent had positive significant effect to the adoption of broiler production practices by the farmers, which indicates more the time spent in broiler farming more use of broiler production practices. So, the broiler farmers should spent more time in their farming to increase adoption of broiler production practices.

v. Benefit Cost Ratio (BCR) had significant effect to the adoption of broiler production practices by the farmers. So, the DLS and NGO_s should influence the broiler farmers to make more investment for getting more production of broiler.

5.3 Recommendations

5.3.1 Recommendations for policy implications

On the basis of observation and conclusions drawn from the findings of the study following recommendations are made:

i. It is recommended that the effective and necessary steps should be taken by the Department of Livestock Services (DLS), and Non-Government Organizations (NGO_s) for strengthening extension and motivational campaign for the broiler farmers so as to increase adoption of broiler production practices by the farmers in broiler production to a greater extent.

ii. It is recommended that the extension and livestock workers should arrange more educational program for the broiler farmers to increase their knowledge on broiler production that could help the broiler farmers to adopt more of broiler production practices for getting higher/increased broiler production.

iii. It is recommended that the broiler farmers should increase their Feed Consumption Ratio (FCR) in broiler production by supplying the proper amount of feed to the broiler at the right time and at the right way. The government should take steps to keep the market price of feed within farmers capacity.

iv. It is recommended that the extension and livestock workers should encourage the broiler farmers to spend more time in broiler production that could help the farmers to make more adoption of broiler production practices and ultimately the farmers could get more production and benefit from the broiler production.

5.3.2 Recommendations for further study

On the basis of scope and limitations of the present study and observation made by the researcher, the following recommendations are made for further study.

i. The present study was conducted in Boalmari upazila under Faridpur district. It is recommended that similar studies should be conducted in other areas of Bangladesh.

ii. This study investigated the contribution of 12 characteristics of the farmers with their adoption of broiler production practices by the farmers as dependent variables. Therefore, it is recommended that further study should be conducted

with other characteristics of the adoption of broiler production practices by the farmers in broiler production.

iii. The present study was concern only with the extent of broiler production practices by the farmers in broiler production. It is therefore suggested that further studies should be included more reliable adoption of concerned variable is necessary for further study.

iv. The study was based on the adoption of broiler production practices by the farmers. Further studies may be conducted in respect of adoption of broiler production practices by the farmers of other poultry or other livestock production.

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APPENDIX A
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ADOPTION OF BROILER PRODUCTION PRACTICES BY THE FARMERS

Sample no……

Personal Information:

Name: …….....

Village: …… Union:..…… …….

Upazila: …….....…… District: ……

Mobile: …….

1. **Age of the respondents:** ……years.
2. **Educational qualification:** Please mention your educational qualification.
   a) Can not read and write…….
   b) Can sign only……
   c) ……..class passed

3. **Experience in broiler production:** How many years you are engaged in broiler production? ……years.

4. **Family labour:** Please mention that how many of your family members are engaged as a labour in broiler production.……

5. **Amount of investment:** Have you any invested for broiler production? If yes, How much? ……TK.

6. Credit receive: Have you received any credit? If yes, How much?.....TK.

7. Feed Consumption Ratio (FCR) from broiler production: Please mention the Feed Consumption Ratio (FCR) of your broiler production farm.

Batch No.	Amount of Feed Use (Kg.)	Amount of Broiler Production (Kg.)	FCR
Last			
2nd			
1st			
Average			

8. Benefit Cost Ratio (BCR) from broiler production: Please mention the BCR of last 3 batches of your broiler production farm.

Batch No.	Amount of production (Kg)	Price per Kg (TK.)	Total Income (TK.)	Total Production Cost (TK.)	BCR
1st					
2nd					
3rd					
Average					

9. Knowledge on broiler production:

Sl. No.	Questions	Total Marks	Marks Obtained
1	Mention two strains of broiler.	1	
2	What types of feed are used for broiler production?	1	
3	Mention two diseases of broiler.	1	
4	How the broiler house should be cleaned and at what intervals ?	1	
5	Mention two broiler production problems.	1	
6	What is the main cause of less production of broiler?	1	
7	Mention two vaccines of broiler.	1	
8	What steps you generally taken to keep the broiler house healthy and free from germs?	1	
9	Why broiler production should be done?	1	
10	Mention the water requirement of broiler.	1	
11	What is the appropriate time of vaccination?	1	
12	What type of house is required in broiler production?	1	
13	Mention two marketing problems of broiler production.	1	
14	What steps should be taken after the death of infected diseases?	1	
15	Mention two transport problems of broiler production.	1	
	Total	15	

10. Extension contact: Please mention the extent of contact with the following media in respect of various information related to your broiler production.

Sl. No.	Communication media	Regularly (3)	Occasionally (2)	Rarely (1)	Not at all (0)
1	Neighboring broiler farmers	10-12 times/month	5-7 times/month	2-3 times/month	0 time/month
2	Input Dealers	4-5 times/month	2-3 times/month	1-2 times/month	0 time/month
3	Vaccinator/Village related person (Livestock)	3-4 times/month	2-3 times/month	1-2 times/month	0 time/month
4	Livestock field stuff	3-4 times/month	2-3 times/month	1-2 times/month	0 time/month
5	NGO worker	3-4 times/year	2-3 times/year	1-2 times/year	0 time/year
6	Upazila Livestock Officer/ Veterinary Surgeon	5-6 times/year	3-4 times/year	1-2 times/year	0 time/year

11. Broiler Production Training Exposure: Please mention your training information regarding the following table.

Title of training	Duration for training (Day)	Name of Institution

12. Time spent in broiler management……hours/day.

13. Adoption of broiler production practices: Please give your information about the use of following broiler production practices.

Sl. No.	Items/Operation	Extent of adoption from past to present				
		Very High (5)	**High (4)**	**Moderate (3)**	**Low (2)**	**Very low (1)**
1	Cleaning and disinfectioning	1-2 days interval	2-3 days interval	3-4 days interval	4-5 days interval	5-6 days interval
2	Brooding	1st 5-7 days/batch	1st 4-5 days/batch	1st 3-4 days/batch	1st 2-3 days/batch	1st 1-2 days/batch
3	Vaccination	4-5 times/batch	3-4 times/batch	2-3 times/batch	1-2 times/batch	1 time/batch
4	Medication (Antibiotic and Pro-biotic)	4-5 times/batch	3-4 times/batch	2-3 times/batch	1-2 times/batch	1 time/batch
5	Littering	4-5 times/batch	3-4 times/batch	2-3 times/batch	1-2 times/batch	1 time/batch
6	Lighting	20-24 hours/day	16-20 hours/day	12-16 hours/day	8-12 hours/day	4-8 hours/day
7	Use of improved varieties	4-5 varieties/year	3-4 varieties/year	2-3 varieties/year	1-2 varieties/year	1 variety/year
8	Use of Ventilation system/Fan	20-24 hours/day	16-20 hours/day	12-16 hours/day	8-12 hours/day	4-8 hours/day
9	Proper feeding	10-12 times/day	8-10 times/day	7-8 times/day	5-7 times/day	3-5 times/day

(Thank you for your nice cooperation)

……..

Date: ……. Signature of interviewer

APPENDIX-B

CORRELATION MATRIX N-103

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	Y
X_1	-												
X_2	-.075	-											
X_3	.206*	.526**	-										
X_4	.213*	.282**	.474**	-									
X_5	.145	.645**	.737**	.371**	-								
X_6	.217*	.586**	.480**	.309**	.504**	-							
X_7	.006	.798**	.687**	.315**	.773**	.570**	-						
X_8	.040	.830**	.722**	.389**	.778**	.652**	.882**	-					
X_9	.005	.772**	.749**	.370**	.782**	.534**	.942**	.921**	-				
X_{10}	.086	.592**	.493**	.324**	.495**	.488**	.632**	.746**	.667**	-			
X_{11}	.057	.702**	.488**	.384**	.586**	.520**	.622**	.709**	.628**	.409**	-		
X_{12}	.016	.728**	.780**	.394**	.784**	.569**	.877**	.877**	.908**	.624**	.643**	-	
Y	-.011	.791**	.741**	.338**	.801**	.576**	.952**	.918**	.961**	.676**	.653**	.922**	-

*. Correlation is significant at the 0.05 level.

**. Correlation is significant at the 0.01 level.

X_1= Age of the respondents

X_2= Educational qualification

X_3= Experience in broiler production

X_4= Family labour

X_5= Amount of investment

X_6= Credit receive

X_7= Feed Consumption Ratio (FCR)

X_8= Benefit Cost Ratio (BCR)

X_9= Knowledge on broiler production

X_{10}= Extension contact

X_{11}= Broiler production Training exposure

X_{12}= Time spent in broiler management

Y= Adoption of broiler production practices by the farmers