

**FARMERS' ATTITUDE TOWARDS THE USE OF DOLOCHUN
FOR CROP PRODUCTION**

**A Thesis
By**

MD. MAMUNAR-RASHID

Student No. 1305043

Session: 2013-2014

Semester: January-June

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**MASTER OF SCIENCE
IN
AGRICULTURAL EXTENSION**

**Department of Agricultural Extension
Hajee Mohammad Danesh Science and Technology University
Dinajpur**

June 2014

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ABSTRACT

FARMERS' ATTITUDE TOWARDS THE USE OF DOLOCHUN FOR CROP PRODUCTION

The main focus of the present study was to investigate the attitude of the farmers towards the use of *dolochun* for crop production, to explore relationship between the selected characteristics of the respondents and their attitude towards *dolochun* and also to identify constraints faced by the farmers in adopting *dolochun*. The study was conducted in three unions under Domar upazila in Nilphamari district. Data were collected from randomly selected 104 farmers, (34 percent of the population of 310). The attitude of the farmers towards the use of *dolochun* for crop production was examined with 5-point rating scale. Karl Pearson's Product Moment correlation coefficient (r) was computed to explore the relationships between dependent and independent variables. Nine selected characteristics (i.e. age, educational qualification, family size, farm size, annual family income, training exposure, organizational participation, extension media contact and agricultural knowledge) of the farmers constituted the independent variables where farmers' attitude towards the use of *dolochun* for crop production was the dependent variable of the study. The findings revealed that the majority of the farmers (58.7 percent) had 'moderately favorable' attitude towards *dolochun* while 22.1 percent and 19.2 percent had 'highly favorable' and 'slightly favorable', attitude towards the use of *dolochun* for crop production, respectively. Correlation analysis showed that the 'educational qualification', 'training exposure', 'organizational participation', 'extension media contact' and 'agricultural knowledge' had positive significant relationship with their attitude towards the use of *dolochun* for crop production, while the 'age' and 'family size' of the respondent had negative significant relationships with their attitude towards *dolochun* to reduce soil acidity and increase crop production. The major constraints faced by the farmers in adopting *dolochun* were 'unavailability of *dolochun* in pick period', 'lack of knowledge about *dolochun*', 'ignorance of farmers about the advantage of *dolochun*' and 'lack of training on *dolochun* application'.

CHAPTER 1

INTRODUCTION

1.1 General Background of the Study

Bangladesh is an agricultural country. The land area of Bangladesh is 147,570 square kilometers with a population of 15,58,00,000 (BBS, 2014). Agriculture is the single largest producing sector of the economy and it contributes about 22 percent to the total Gross Domestic Product (GDP) of the country. GDP growth rate of the country mainly depends on the performance of the agricultural sector. Although due to natural calamities loss of food and cash crop is almost regular phenomenon. Bangladesh incurs annual loss of 1.81 percent of GDP due to extreme weather events. Total losses were 2.19 billion dollar a year from 1990 to 2008. Bangladesh scores eight on risk index (Anonymous, 2010).

Bangladesh is an overpopulated country. Day by day these population increases simultaneously the agricultural land decreases. The farmers of our country cultivated two or more crops in every year to meet the demand of this large population. On the other hand they do not use balance fertilizer for crop production. Simultaneously as a result the fertility of land decreases day by day and increases soil acidity. In this acidic soil Phosphorous, Molybdenum, Aluminum and Iron remains in high quantity resulting decreased crop production.

In our country approximately fifty thousand hectares land are highly acidic to acidic having a low pH as 5.5 to 5. This large amount of soil is known as ill soil. The soil of North-western region of our country (including greater Rangpur, Dinajpur) is acidic having low pH range hampered crop production. To obtain expected yield this acidic soil should be cured. Cornell University, USA and Wheat Research Centre, Dinajpur introduced the optimum dose of *dolochun* to cure this acidic soil (Anonymous, 2013).

Dolochun is a white powderish product that can be found as *dolochun*, *dolooxychun* or *dolomite powder* in local market. By applying *dolochun* in optimum doses these highly acidic soil can be maintained in balanced level required to crop production. *Dolochun* contains required amount of calcium and magnesium that helps to reduce acidity in optimum level. The optimum dose of *dolochun* is 1000 kg per hectare (Anonymous, 2013).

1.2 Statement of the Problem

Bangladesh is an agricultural country. More than 80 percent people depend on agriculture directly or indirectly. Agricultural land of our country decreases day by day, but population increases geometrically. The most important reasons for declining soil health are unbalanced use of chemical fertilizers, almost no use of organic matter, lack of awareness about soil fertility management etc. In Bangladesh most of the farmers used inorganic fertilizer in place of organic fertilizer. Consequently, environment is being polluted through soil, air and water pollution. Besides, beneficial organisms, microbes etc are being destroyed. Human health is being threatened and disease susceptibility is being accelerated. The use of chemical fertilizers for crop production creates a strong nutritional imbalance in soils by increasing the reserve of particular nutrients or decreasing the initial status through enhanced uptake by crops.

At present the high time to set up our mind to develop our agriculture for increasing crop production and ensure food security. Researchers and scientists are expressed to develop our agriculture sector in two ways. One is developing High Yielding Variety (HYV) and another is innovation of soil and land management technology. Researchers found that soil liming is a most important technology to acid soil management for increasing crop production and ensure food security. Hence this technology should be disseminated rapidly. Naturally and by manmade causes, soil of North-West and North-East part of Bangladesh is highly acidic (soil pH <5.5). As a result yield of different crop is decreasing day by day.

1.3 Justification of the Study

The harmful effect of chemical agriculture is the degradation of soil physical, chemical and biological qualities. Soil loses its pH balance and increases soil acidity due to the application of agro-chemicals. Farmers of our country use *dolochun* every year in their crop field randomly to reduce soil acidity and increase crop production. Most of the farmers do not know the actual doses of *dolochun* application but they apply it every year. There is an optimum dose of *dolochun* application and once *dolochun* is applied, there is no need to apply following three years. From the above discussion, it is clearly understood that, at the present situation *dolochun* is one of the most important and efficient inputs for crop production. Therefore it is necessary to develop an effective management practices for this issue. Moreover, it is found that there was no study in this regards.

After considering the above facts, the present study has been undertaken to determine and describe the attitude of the farmers towards the use of dolochun for crop production and find out the constraints faced by the farmers in adopting dolochun.

1.4 Specific Objectives of the Study

The following specific objectives are formulated to give proper direction to the study:

1. To determine and describe the attitude of the farmers towards use of dolochun for crop production.
2. To determine and describe the following selected characteristics of the farmers:
 - i. Age
 - ii. Educational qualification
 - iii. Family size
 - iv. Farm size
 - v. Annual family income
 - vi. Training exposure
 - vii. Organizational participation
 - viii. Extension media contact
 - ix. Agricultural knowledge
3. To explore the relationships between the selected characteristics of farmers and their attitude towards use of dolochun.
4. To identify the constraints faced by the farmers in adopting dolochun.

1.5 Assumptions of the Study

The researcher kept the following assumptions in mind while undertaking this study:

1. The respondents, included in the sample were capable of furnishing proper responses to the questions included in the interview schedule.
2. Views and opinions furnished by the respondents were the representative views and opinions of the whole population of the study.
3. The responses furnished by the respondents were reliable. The researcher who acted as the interviewer as well as adjusted to the social environment of the study area. So the respondents gave their opinions without any hesitation.
4. All the data concerning the independent and dependent variables were normally and independently distributed with their respective means and standard deviation.
5. The findings of the study have general applications to other parts of the country with similar personal, socio-economic and cultural conditions of the study area.

1.6 Limitations of the Study

Considering the time, money and other necessary resources available to the researcher and to make the study manageable and meaningful it became necessary to impose certain limitations. The limitations were as follows:

- i. The study was confined to three unions namely Domar, Vogdaburi and Jorabari of Domar upazila under Nilphamari district.
- ii. There are many characteristics of the farmers in the study area but only nine of them were selected for investigation.
- iii. For information about the study, the researcher was depending on the data furnished by the selected respondents during their interview with him.
- iv. In many situations, the researcher faced unexpected interference from the over-interested side-talkers of the non-target respondents.

1.7 Definition of Key Terms

Attitude: Attitude means one's feelings, beliefs and actions towards an object and concept. This variable is operationalized by developing an attitude scale, following Likert method of summated ratings.

Attitude towards Dolochun: It refers to extent of willingness of a respondent to take part in adopting dolochun. In other words it means farmers' belief, feelings and actions tendencies on dolochun utilization.

Annual family income: Income was defined as the total financial return per year of a family from farm (crops, livestock, poultry, and fish) and non-farm sources. (service, business, selling labor, bank interests, remittance, financial help from relatives, etc).

Constraint: It means any difficult situation which requires some actions to minimize the gap between "what ought to be" and "what is". The term constraints refers to different problems faced by the farmers in using *dolochun*.

Education: Education is the process of changing knowledge, skill and attitude of an individual to the desired dimension. It will be measured in terms of years of schooling completed by an individual at the time of interview.

Family size: Family size of household will be defined as family including family head and other dependent.

Farm size: Farm size refers to the total area, on which a farmer's family carries on farming operations, the area being estimated in terms of full benefit to the farmer's family.

NGO: An organization developed and managed by private initiatives being foreign and financed is a Non Government Organization (NGO). It works independently with and is mandated to collaborate with others unless there is any felt need (Halim and Ahmed, 1999).

Organizational participation: It expressed the duration of participation in different organizations.

Training exposure: It referred to the total number of days that a respondent received training in her entire life from different organization under different training programs.



CHAPTER 2

REVIEW OF LITERATURE

In this Chapter, review of literatures relevant to the objectives is presented. This is mainly concerned with farmers' attitude towards the use of *dolochun* for crop production. This Chapter has been presented under three sections. First section deals with concept of attitude, while the second section deals with the review of past studies concerning relationship of the selected characteristics of the farmers with their attitudes. The conceptual framework of the study is presented in third section.

2.1 Concept of Attitude

Attitude is a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person, or situation. Attitude influences an individual's choice of action, and responses to challenges, incentives, and rewards (Business Dictionary, 2012). The readiness to respond to a certain object in a favorable or unfavorable fashion; every attitude has both an intrinsic belief and a behavioral disposition. Attitudes are a permanent system of evaluations, emotions, and direct behavioral tendencies for or against an object. Individuals develop their attitudes through a continuous process of adaptation to the social environment. Attitudes are organized ways of thinking and acting in relation to facts and people in our environment, and they help influence our overall way of life (Encyclopedia of Britannica, 1960).

Attitudes can also be explicit and implicit. Explicit attitudes are those that we are consciously aware of and that clearly influence our behaviors and beliefs. Implicit attitudes are unconscious, but still have an effect on our beliefs and behaviors (Cherry, 2012).

Attitude, in social psychology, is a predisposition to classify objects and events and to react to them with some degree of evaluative consistency. The concept of attitude arises from attempt to account for observed regularities in the behavior of individual persons. The quality of one's attitude is judged from the observable, evaluative responses he tends to make (Encyclopedia of Britannica, 1960).

Goode (1945) defined the term attitude as a state of mental and emotional readiness to react to situations, person or things, in harmony with a habitual pattern of response previously conditioned to or associated with these stimuli. Attitude is the by-product of an individual's experience and has their bases in inner uses, acquired habits and environmental influences by which he is surrounded.

McGrath (1966) referred to attitude as the learned orientations towards object, or predisposition to behave in certain ways towards a given objects or a class of objects. An attitude has always on object, person, thing or concept and it may be general or specific.

2.1.1 Components of attitude

Krech *et al.* (1962) explains attitude as a system of the interrelated components that the authors express as “In defining attitude as systems, we are emphasizing the interrelatedness of the three attitude components. When incorporated in a system, these components become manually interdependent about an object are influenced by his feelings and action tendencies toward that object. And a change in his cognition about the object will tend to produce changes in his feelings and action tendencies toward it.”

Another definition of attitude made by Triandis (1971), “an attitude is an idea changed with emotion, which predisposes a class or actions to a particular class or social situation.” This definition suggests that attitude has three components, those components are cognition, affective and behavioral, are:

- a) The cognitive component of attitude consists of the belief of the individual about the object. This may also be said as understanding, knowledge and conception.
- b) The feeling or affective component of an attitude refers to the emotions connected with the object. The object is felt to be pleasing or displeasing; it is liked or it is disliked.
- c) The action or behavioral component of an attitude includes all die behavioral readiness associated with the attitude.

2.1.2 Formation of attitude

Attitudes form directly as a result of experience. They may emerge due to direct personal experience, or they may result from observation. Social roles and social norms can have a strong influence on attitudes. Social roles relate to how people are expected to behave in a particular role or context. Social norms involve society's rules for what behaviors are considered appropriate.

Attitudes can be learned in a variety of ways. Consider how advertisers use classical conditioning to influence your attitude toward a particular product. In a television commercial, one see young, beautiful people having fun in on a tropical beach while enjoying a sport drink. This attractive and appealing imagery causes you to develop a positive association with this particular beverage. Operant conditioning can also be used to influence

how attitudes develop. Imagine a young man who has just started smoking. Whenever he lights up a cigarette, people complain, chastise him and ask him to leave their vicinity. This negative feedback from those around him eventually causes him to develop an unfavorable opinion of smoking and he decides to give up the habit.

Finally, people also learn attitudes by observing the people around them. When someone you admire greatly espouses a particular attitude, you are more likely to develop the same beliefs.

For example, children spend a great deal of time observing the attitudes of their parents and usually begin to demonstrate similar outlooks (Cherry, 2012).

2.1.3 Changes of attitude

While attitudes can have a powerful effect on behavior, they are not set in stone. The same influences that lead to attitude formation can also create attitude change. The theories of attitude that can influence people's attitude are:

Learning theory of attitude change: Classical conditioning, operant conditioning and observational learning can be used to bring about attitude change. Classical conditioning can be used to create positive emotional reactions to an object, person or event by associating positive feelings with the target object. Operant conditioning can be used to strengthen desirable attitudes and weaken undesirable ones. People can also change their attitudes after observing the behavior of others.

Elaboration likelihood theory of attitude change: This theory of persuasion suggests that people can alter their attitudes in two ways. First, they can be motivated to listen and think about the message, thus leading to an attitude shift, or they might be influenced by characteristics of the speaker, leading to a temporary or surface shift in attitude. Messages that are thought-provoking and that appeal to logic are more likely to lead to permanent changes in attitudes.

Dissonance theory of attitude change: As mentioned earlier, people can also change their attitudes when they have conflicting beliefs about a topic. In order to reduce the tension created by these incompatible beliefs, people often shift their attitudes (Cherry, 2012).

2.2 Review of Literature on Farmers' Attitude

Ahmed (2013) reported that maximum (60 percent) of the farmers had highly favorable attitude towards thai koi farming. Correlation coefficient analyses indicate that the characteristics of the farmers namely age, education, knowledge regarding thai koi farming,

training experience were found to have significant positive relationships with their attitude towards thai koi farming.

Khan (2012) found that the majority (64 percent) of the farmers had moderately favorable attitude, compared to 29 percent having favorable and only one percent had unfavorable attitude towards modern jujube cultivation. Correlation analyses indicated that farm size, area under jujube cultivation, income from jujube and extension media contact of the farmers had significant positive relationships with their attitude towards modern jujube cultivation. Age, education, household size, training exposure, organizational participation, however, had no significant relationships with their attitude towards modern jujube cultivation.

Shahin (2012) found that, highest proportion (38 percent) of farmers had 'moderately favorable' while 32 percent and 30 percent had 'highly favorable' and 'slightly favorable' attitude towards the use of Cattle Health Card (CHC) under SDVC project of CARE respectively. Correlation analyses showed that the characteristics of the farmers' namely educational qualification, annual family income and agricultural knowledge had significant positive relationships with their attitude towards the use of cattle health card under SDVC project of CARE.

Samad (2010) found that the majority (69.84 percent) of the farmers had favorable attitude, while one percent had unfavorable attitude and 29.16 percent had neutral attitude for the project farmers. The attitude score of non-project farmers showed that the majority (58.33. percent) possessed neutral attitude, 2.08 percent had favorable attitude and 39.59 percent had favorable attitude towards aerobic rice cultivation. Correlation analyses showed that five characteristics of the farmers namely education, cosmopolitaness, organizational participation, training experience and agricultural knowledge had significant positive relationships with their attitude towards aerobic rice cultivation. However, there was significant difference in mean values with organizational participation, training experience and agricultural knowledge and farmers' attitude between the project and non project farmers.

Dzomeku *et al.* (2009) revealed that smallholders contribute significantly to the agricultural gross domestic product of most developing countries. The majority (84 percent) of the farmers indicated that the hybrids were superior to the landraces in terms of plant establishment, plant growth, vigor and fruit yield.

Ahmed (2006) found that majority (87 percent) of the shrimp farmers had favorable attitude towards shrimp farming compared to 7 percent having neutral and only 6 percent had unfavorable attitude. Correlation analyses indicated that knowledge about shrimp farming,

training experience, and extension media contact of the farmers had significant positive relationships with their attitude towards shrimp farming. Age, education, family size, farm size, annual income, cosmopolitaness and credit availability of farmers, had no significant relationship with their attitude towards shrimp farming. Among the problems, high sensitivity to diseases of shrimp rank first and other problems (in descending order) are: natural calamities, non-availability of credit in time, high price of post larvae, lack of technological knowledge about shrimp culture, lack of marketing facilities, non-availability of post-larvae in time, lack of training about shrimp culture, high price of shrimp feed and lack of sufficient water in *gher* in time.

Uddin *et al.* (2006) observed equal proportion of farmers (39 percent) having moderately favorable and highly favorable attitude towards sustainable agriculture. On the other hand, 4 percent and, 18 percent farmers had highly unfavorable and moderately unfavorable attitude towards sustainable agriculture respectively. Farmers level of education, farm size, annual family income, training exposure, knowledge of environment friendly farming, experience of environment friendly farming practice and innovativeness had positive and significant relationship with their attitude towards sustainable agriculture. The major problems confronted by the farmers in practicing sustainable agriculture were: lack of insects/diseases resistance varieties of crops, lack of training facilities related to sustainable agriculture, lack of knowledge about environment friendly production technology of crops, and lack of knowledge about IPM attitude.

Khan (2004) attempted to determine the attitude of farmers towards groundnut cultivation and to explore relationships between twelve selected characteristics of the farmers and their attitude. The author purpose of the study was to determine the adoption of improve practices by the farmers in cultivating groundnut and to identify the problems faced by the farmers in groundnut cultivation. The overwhelming majority (93.14 percent) of the groundnut farmers had favorable attitude towards groundnut cultivation compared to 4.90 percent having neutral and only 1.96 percent had unfavorable attitude. Correlation analysis indicated that education, farm size, agricultural knowledge, agricultural training experience and innovativeness of the farmers had significant positive relationships with their attitude towards groundnut cultivation. As regards to adoption of improved practices, none of the farmers cultivated HYV of groundnut, used irrigation in their groundnut fields and insecticides and pesticides, but only about one-tenth (8.82 percent) of them used fertilizer but not at recommended doses. About haff (48.03 percent) of the farmers used power tiller for their land preparation. The

groundnut' farmers faced such major as unavailability of good seeds scarcity of laborers in sowing and harvesting time and heavy rainfall in harvesting time.

Sarkar (2004) studied the attitude of the imams towards improved agricultural technologies and to explore the relationships between selected characteristics of the imams and their attitude towards improved agricultural technologies. The findings of this study revealed that 28.75 percent of the imams had favorable attitude towards crop cultivation, while 51.25 percent had moderately favorable attitude and the rest 20 percent had less favorable attitude towards crop cultivation. For livestock development, 225 percent of the imams had favorable attitude, while 67.5 percent had moderate and the rest 10 percent had less favorable attitude towards livestock development. For fish culture, 28.75 percent had favorable, 66.25 percent had moderate and rest 5 percent had less favorable attitude towards fish culture. Again, 16.25 percent of the imams had favorable attitude towards overall improved agricultural technologies, while 70.0 percent had moderate and rest 13.75 percent had less favorable attitude towards overall improved agricultural technologies. The correlation test towards improved agricultural technologies for overall attitude showed that general education, religious education, knowledge on improved agricultural technologies, training exposure, cosmopolitaness, organizational participation and communication exposure showed a significant positive relationship.

Farhad and Kashem (2004) conducted a study to determine attitude of rural women in using IPM in vegetable cultivation and to explore the relationship between the selected characteristics of the women and their attitude of IPM in vegetable cultivation. The majority (68 percent) of the respondents had medium attitude while 17 percent low attitude and 15 percent high attitude in using IPM in vegetable cultivation. Out of 10 selected characteristics of the respondents, education, cosmopolitaness and contact with extension media had positive significant relationship.

Chowdhury (2003) observed that majority of the farmers in progressive village held moderately favorable attitude (52 percent) compared to farmers of traditional village of whom 43 percent held moderately favorable and 29 percent held moderately unfavorable attitude towards crop diversification. Farmers of progressive village having favorable attitude towards crop diversification were more than the farmers of traditional village. Overall 61 percent farmers of the study area had moderately favorable to highly favorable attitude towards crop diversification. Out of twelve selected characteristics of the farmers seven, namely, level of education, family annual income, and cosmopolitaness, knowledge on crop

diversification, risk orientation, and awareness on adverse effect of rice monoculture were positively correlated with their attitude towards crop diversification.

Haque (2002) carried out a study to assess the extent of attitude of rural women in selected homestead agriculture activities viz. homestead vegetable cultivation, poultry raising, goat rearing, fish cultivation and tree plantation. The highest percentage of the rural women had moderate favorable attitude in each of the five selected activities. These were 85 percent in poultry rising, 83 percent in goat rearing, 78 percent in fish cultivation, 72 percent in tree plantation, and 70 percent in vegetable cultivation. The correlation analysis showed that education, farm size and family income of the rural women had positive relationship with their attitude to all of the activities and in most cases the relationship was significant.

Sarkar (2002) revealed that the majority of rice growers (62.37 per cent) had moderately unfavorable attitude towards the use of DAP while 26.73 per cent and 5.95 per cent had moderately favorable and highly favorable attitude respectively towards the use of DAP. Only 4.95 per cent fell in highly unfavorable attitude. Correlation analysis showed that the educational qualification, annual income, extension media contact, cosmopolitaness, agricultural knowledge of rice growers had positive significant relationship with their attitude towards the use of DAP. The top two important problems according to rank order as faced by the rice growers in using were release nutrient as urea, i) DAP cannot fast ii) lack of training of rice growers.

2.2.1 Review of literature related to selected characteristics of the farmers with their attitude

2.2.1.1 Age and attitude

Ahmed (2013) observed that age of the respondents had positively significant relationship with their attitude towards thai koi farming.

Khan (2012) found that age of the jujube farmers had no significant relationship with their attitude towards modern jujube cultivation.

Shahin(2012) observed that age of the respondents had no significant relationship with their attitude towards SDVC project of CARE.

Parvez (2007) concluded that there was no relationship between age of the farmers and their attitude towards IPM for HYVs production.

Rahman *et al.* (2007) found that there was negatively significant relationship between age of the farmers and their attitude towards organic farming.

Chowdhury *et al.* (2006) reported in his study that age of the farmers had no significant relationship with their attitude towards sustainable agriculture.

Parveen (2004) found that age of the modern village women influenced their attitude towards homestead agricultural production. But in case of the women of the traditional village, age was not associated with their attitude towards homestead agricultural production.

2.2.1.2 Educational qualification and attitude

Ahmed (2013) observed that educational qualification of the respondents had positively significant relationship with their attitude towards thai koi farming.

Khan (2012) found that educational qualification of the jujube farmers had no significant relationship with their attitude towards modern jujube cultivation.

Shahin(2012) observed that educational qualification of the respondents had no significant relationship with their attitude towards SDVC project of CARE.

Parvez (2007) concluded that there was positive significant relationship between education of the farmers and their attitude towards IPM for HYVs production.

Rahman *et al.* (2007) found that there was positively significant relationship between academic qualification of the farmers and their attitude towards organic farming.

Chowdhury *et al.* (2006) reported in his study that academic qualification of the farmers had positive significant relationship with their attitude towards sustainable agriculture.

2.2.1.3 Family size and attitude

Shahin (2012) found that there was no significant relationship between family size of the farmers and their attitude towards SDVC project of CARE.

Parvez (2007) concluded in his study that there was no significant relationship between family size of the farmers and their attitude towards IPM for HYVs production.

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Chowdhury *et al.* (2006) reported in his study that farm size of the farmers had positive significant relationship with their attitude towards sustainable agriculture.

2.2.1.5 Annual family income and attitude

Ahmed (2013) observed that annual family income of the respondents had no significant relationship with their attitude towards thai koi farming.

Shahin(2012) observed that annual family income of the respondents had significant relationship with their attitude towards SDVC project of CARE.

Parvez (2007) concluded in his study that there was no significant relationship between annual income of the farmers and their attitude towards IPM for HYVs production.

Rahman *et al.* (2007) found that there was no significant relationship between annual family income of the farmers and their attitude towards organic farming.

Chowdhury *et al.* (2006) reported in his study that annual family income of the farmers had no significant relationship with their attitude towards sustainable agriculture.

2.2.1.6 Training exposure and attitude

Ahmed (2013) observed that training exposure of the respondents had positively significant relationship with their attitude towards thai koi farming.

Habib (2000) found that training experience of BBS had significant relationship with their attitude towards the use of agrochemicals.

Paul (2000) Observed that there was a positive significant relationship between training experience of the farmers and their attitude towards the use of urea super granule.

2.2.1.7 Organizational participation and attitude

Samad (2010) found in his study that organizational participation of farmers had significant positive relationship with attitude. Nurzaman (2000), Hoque (1993) and Noor (1995) observed similar findings in their respective studies.

Sarker (2001) conducted a study that revealed organizational participation of farmers had negative relationship with attitude towards organic homestead gardening program.

Habib (2000) conducted a study on attitude towards the use of agrochemicals that revealed organizational participation had no relationship with attitude towards the use of agrochemicals.

2.2.1.8 Extension media contact and attitude

Bari (2000) concluded that extension media contact of rice growers had no significant relationship with their attitude towards hybrid rice AALOK 6201.

Habib (2000) found that there was no significant relationship between BSs and their attitude towards the use of agrochemicals.

Nurzaman (2000) in his study observed that extension contact of the FFS farmers had positively significant relationship with their attitude on IPM but in case of non-FFS farmers had no significant relationships with their attitude on IPM

2.2.1.9 Agricultural knowledge and attitude

Ahmed (2013) observed that agricultural knowledge of the respondents had positively significant relationship with their attitude towards thai koi farming.

Shahin(2012) observed that knowledge of SDVC project activities of the respondents had significant positive relationship with their attitude towards SDVC project of CARE.

Rahman *et al.* (2007) found that there was significant relationship between knowledge on organic farming of the farmers and their attitude towards organic farming.

Chowdhury *et al.* (2006) reported in his study that knowledge of environment friendly farming of the farmers had positive significant relationship with their attitude towards sustainable agriculture.

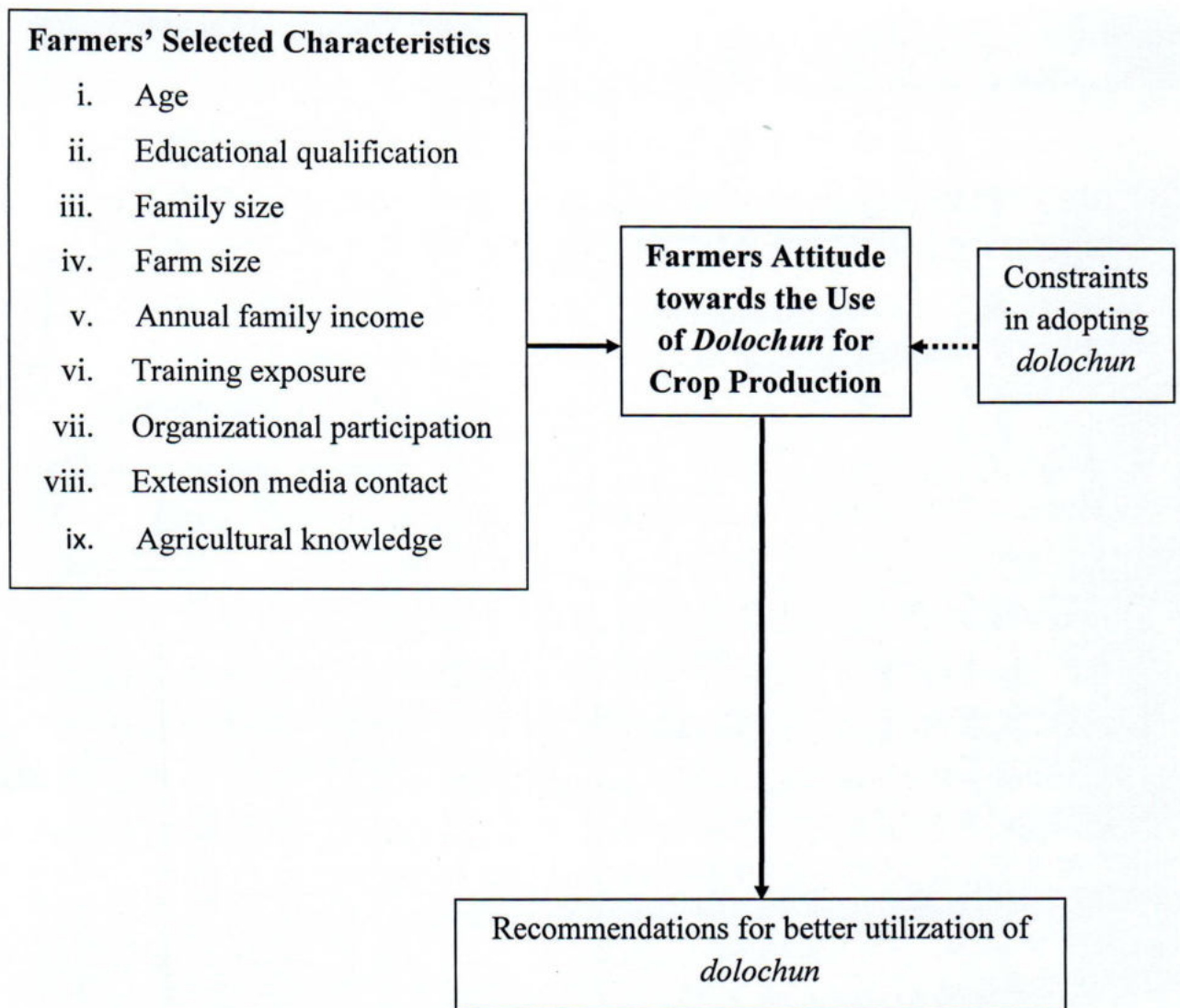
Mannan (2001) observed in his study that there was a positive significant relationship between the agricultural knowledge of Proshika farmers and their attitude towards the Ecological Agricultural Program.

2.3 The Conceptual Framework of the Study

Conceptual frameworks are a type of intermediate theory that attempt to connect to all aspects of inquiry (e.g. problem definition, purpose, literature review, methodology, data collection and analysis). Conceptual frameworks can act like maps that give coherence to empirical inquiry. Because conceptual frameworks are potentially so close to empirical inquiry, they take different forms depending upon the research question or problem (Wikipedia, 2012).

In order to develop the conceptual framework for the independent and dependent variables of this study, attitude is conceptualized having three components as: i) cognitive domain come from head ii) affective domain come from heart and iii) behavior components come from different visible parts of the body such as hand, skin, ear, eye, etc. From the past studies and literature it is observed that various factors influenced and affected farmers in acquiring their attitude towards innovation. In this study the researcher attempted to highlight three concepts, namely farmers' selected characteristics, farmers' attitude towards *dolochun* and constraints being confronted by the farmers in adopting *dolochun*. An individual's attitude may be influenced by his/her personal characteristics and through other interacting forces in his/her surroundings. As it is quite impossible to deal with all the forces and characteristics in a single study, it is, therefore, needed to be confined with some selected characteristics.

Personal characteristics, economic characteristics, psychological characteristics, social characteristics, etc. may also influence on problem confrontation and vice-versa. On the basis of above discussion and review of literature, the conceptual framework of this study has been structured as shown in figure 2.1.



Legend:

- Direct relation
-→ Indirect relation

Figure 2.1 Conceptual framework of the study

CHAPTER 3

METHODOLOGY

Methodology deserves a very careful consideration in any scientific research. Importance of methodology in considering any research cannot be neglected. Methodology should be such as would enable the researcher to collect decisions. Keeping this point in view, the researcher took utmost care for using proper method in all aspects of this investigation. This chapter contains the methods and procedures in the present study in accordance with the objectives.

3.1 Locale of the Study

For conducting this research, Domar Upazila under Nilphamary District was selected as the study area. Domar upazila consists of nine unions. Out of these, three unions namely Domar, Vogdaburi and Jorabari were selected purposively for conducting the study.

3.2 Population and Sample

The farmers under the “Food for Progress for Bangladesh Project” of RDRS Bangladesh of three unions (Domar, Vogdaburi and Jorabari) under Domar upazila was the population of the study. An Updated list of 310 farmers was collected from RDRS Bangladesh. Out of them, a sample of 104 farmers (34 percent) was selected by random sampling method. Simultaneously a reserve list of 10 farmers was made in order to use in case of unavailability of sampled farmers.

3.3 Research Instrument

In order to collect relevant data for the study, a structured interview schedule was prepared keeping the objectives in mind. The questions and statements contained in the schedule were simple, direct and easily understandable by the respondents. The schedule contained both open and closed form of questions. A draft interview schedule was prepared in advance before using the same for collection of data. The draft schedule was pre-tested with 10 beneficiaries selected from the study area. This pre-test facilitated the researcher to identify faulty questions in the draft schedule and necessary corrections, addition and adjustment was made afterwards in the schedule on the basis of the pre-test results.



Figure 3.1 Map of Nilphamari district showing Domar upazila

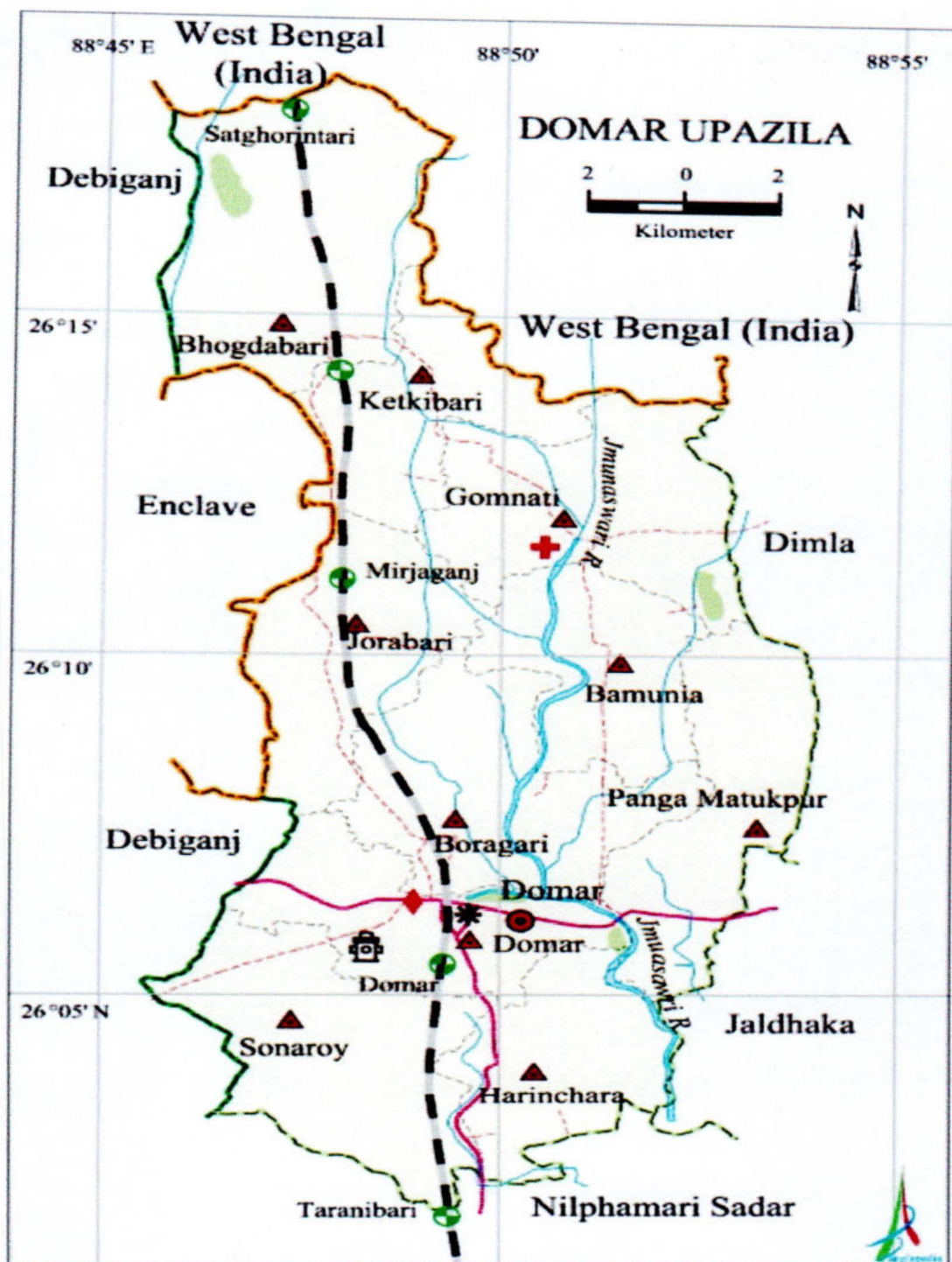


Figure 3.2 Map of Domar upazila showing study area

3.4 Measurement of Variables

3.4.1 Measurement of independent variables

The nine characteristics of the respondents (namely age, educational qualification, family size, farm size, annual family income, training exposure, organizational participation, extension media contact and agricultural knowledge) constituted the independent variables of this study. The measurement procedure of these characteristics discussed below.

3.4.1.1 Age

Age of the respondent was measured in terms of years from his/her birthday to the time of interview which will be found on the basis of response. A unit score was assigned for each year of one's age.

3.4.1.2 Educational qualification

Years of schooling was used to measure educational qualification completed by an individual in educational institutes. If a respondent did not know how to read and write his literacy was taken as zero (0). A score of 0.5 was assigned to that respondent who could sign his name only. Besides this, a respondent was given actual score of one for every year of schooling i.e. 1 for class one, 2 for class two and so on.

3.4.1.3 Family size

The family size was measured by the total number of members in the family of a respondent. The family members included the respondent himself, his wife children and other dependent members who lived and ate together. A unit score was assigned for each member of the family. If a respondent had five members in his/her family, then family size score was given as 5 (Khan, 2004).

3.4.1.4 Farm size

The farm size was measured by the area of the raised land in which the household of the respondent had its entire dwelling unit including homestead area under cultivation (Sarker, 2004). It was expressed in hectare. The total areas of land thus obtained have been considered as farm size of the respondent.

It was measured using the following formula:

$$\text{Farm size} = A + B + C + 1/2(D + E)$$

Where, A= Homestead area

B= Own land under own cultivation

C= Area of land taken from others on lease

D= Area of land given to others as barga

E= Area of land taken from others as barga

3.1.4.5 Annual family income

Annual family income of a respondent was measured by taking the sum of income earned by the respondent himself and other members of the family in a year from different sources like crop, livestock, fisheries and some other non agricultural sources. It was expressed in thousands Taka.

3.4.1.6 Training exposure

Training exposure was determined by the total number of days of training received by the farmers from any organization in their entire lifetime. If a respondent took three days training on agriculture from GOs, NGOs or any other organization, then his training exposure score was 3 and so on (Mandal, 2007).

3.4.1.7 Organizational participation

Organizational participation score of a respondent was computed on the basis of his/her participation in different organizations operating in the study area. The researcher identified 8 such organizations as shown in item 7 in the interview schedule.

3.4.1.8 Extension media contact

Extension media contact score was computed for each respondent on the basis of his extent of contact with 11 selected extension media as ascertained from his responses to question in the interview schedule. The respondents given their opinion against 4-point rating scale as 'regularly', 'often', 'rarely' and 'not at all'. The scores were assigned as 3, 2, 1 and 0, respectively for a statement.

3.4.1.9 Agricultural knowledge

Questions based upon different aspect of agriculture was incorporated in the interview schedule. Each respondent was asked to answer all the 13 questions. A respondent could get

full score against each item for correct responses, 1 for partial answers and 0 for wrong answers. Thus, Agricultural knowledge of respondents was range from 0 to 35. Zero (0) indicating no knowledge and 35 indicating very high agricultural knowledge.

3.4.2 Measurement of dependent variable

Attitude towards dolochun was measured by using twelve different statements. The selected statements were either positive or negative view. The respondents given their opinion against 5-point rating scale as 'strongly agree', 'agree', and 'undecided', 'disagree' and 'strongly disagree'. The scores were assigned as 5, 4, 3, 2 and 1 respectively for a positive statement and a reverse score was assigned for a negative statement. Thus, the possible score was range from 12 to 60, where 12 indicated strongly unfavorable attitude and 60 indicated strongly favorable attitude towards use of dolochun for crop production.

3.5 Data Collection

Data were collected during the period from 15th April to 25th June, 2014. By using the pretested questionnaire, the researchers were first established rapport with the respondents and clearly explain the objectives of the study by using local language as far as possible. As a result, the respondents will furnish proper responses to the questions and statements without any hesitation.

3.6 Compilation of Data

At the end of data collection, the collected data were coded, compiled, tabulated and analyzed. The local units were converted into standard units. The qualitative data were transferred into quantitative data by appropriate scoring technique (s). The responses of the respondents that were recorded in the interview schedule was transferred into a master sheet for analysis of the data.

3.7 Statistical Analysis

The SPSS computer program was used for analyzing the data. Various descriptive statistical measures such as frequency, number, percentage, mean, standard deviation and rank order was used for categorization and describing the variables. Pearson's Product Moment Correlation coefficient (r) was used for testing the relationships between the concerned variables.

CHAPTER 4

RESULTS AND DISCUSSION

The purpose of this Chapter is to describe the findings of the present study. A sequential and detailed discussion on the findings of the study have been presented under the following sections. In the first section the selected characteristics of the farmers have been discussed. The second section deals with the attitude towards the use of *dolochun* for crop production. Relationships between the selected characteristics and farmers attitude towards the use of *dolochun* for crop production has been discussed in the third section. Finally, in the fourth section, the constraints faced by the farmers in adopting *dolochun* have been presented.

4.1 Selected Characteristics of the Farmers

In this section 'nine' selected characteristics have been discussed. The selected characteristics were age, educational qualification, family size, farm size, annual family income, training exposure, organizational participation, extension media contact and agricultural knowledge. The salient features of these characteristics have been presented in Table 4.1.

4.1.1 Age

The age of the farmers ranged from 24 to 57 years. The average being 39.59 years and standard deviation 8.34 years. Based on their age, the farmers were classified into three categories namely, young (up to 35), middle aged (36 to 50) and old (above 50) (Table 4.1). The highest proportions (49.0 percent) of the farmers were found middle aged and 39.5 percent were young aged. While the rest 11.5 percent belonged to old age category.

It indicates that about 88.5 percent of the farmers were young to middle-aged. Young and middle aged farmers might have valuable opinions in using *dolochun*. Young people are generally receptive to new ideas and things. They would have a favorable attitude towards the use of *dolochun* for crop production if necessary steps are taken to disseminate new technologies and practices to them by the extension personnel.

Table 4.1 Characteristics profile of the respondents (N = 104)

Characteristics (measurement unit)	Possible range	Observed value	Respondents			Mean	SD
			Category	No.	%		
Age (year)	Unknown	24 to 57	Young (up to 35) Middle aged (36 to 50) Old (above 50)	41 51 12	39.5 49.0 11.5	39.59	8.34
Educational qualification (year of schooling)	Unknown	0 to 9	Illiterate (0) Can sign only (0.5) Primary education (1 to 5) Secondary education (6 to 10)	30 38 15 21	28.8 36.5 14.5 20.2	2.42	3.10
Family size (number)	Unknown	3 to 8	Small family (up to 4) Medium family (5 to 6) Large family (7 and above)	37 40 27	35.6 38.4 26.0	5.38	1.50
Farm size (hectare)	Unknown	0.194 to 0.802	Landless (up to 0.02 ha) Marginal (0.02 ha to 0.199 ha) Small (0.2 ha to 0.99 ha) Medium (1.0 ha to 3.0 ha) High (above 3.0 ha)	0 1 103 0 0	0 1 99 0 0	0.45	0.11
Annual family income (‘000’ Taka)	Unknown	52.70 to 124	Low income (up to 75) Medium income (75 to 100) High income (above 100)	29 45 30	27.9 43.3 28.8	88.21	16.57
Training exposure (days)	Unknown	0 to 8	No training (0) Low training (1 to 4) Medium (5 to 6) High (above 6)	41 9 35 19	39.4 8.7 33.7 18.2	3.51	3.07
Organizational participation (score)	Unknown	10 to 31	No participation (0) Low participation (up to 15) Medium participation (15 to 25) High participation (above 25)	0 17 69 18	0 16.3 66.4 17.3	20.96	4.81
Extension media contact (score)	0 to 33	11 to 29	Low (up to 14) Medium (15 to 23) High (above 23)	12 74 18	11.5 71.2 17.3	19.0	3.79
Agricultural knowledge (score)	0 to 35	19 to 32	Poor knowledge (up to 22) Fair knowledge (22 to 28) Good knowledge (above 28)	22 66 16	21.2 63.5 15.3	25.62	3.00

4.1.2 Educational qualification

Educational qualification scores of the farmers ranged from 0 to 9.0, the average being 2.42 and standard deviation 3.10. Based on their educational qualification scores, the farmers were classified into four categories namely, illiterate (0), can sign only but not schooling (0.5), primary level (1 to 5) and secondary level (6 to 10) Table 4.1. The largest proportion (36.5 percent) of respondents can sign only. About 14.5 percent of the respondents were under primary level category and 20.2 percent have secondary education. The rest (28.8 percent) of the farmers were illiterate.

Findings indicate that majority of the farmers can sign only. However, as education has a vital role on farmers' attitude towards the use of *dolochun*, the illiterate farmers should be brought under different extension program.

4.1.3 Family size

The family size of the farmers ranged from 3 to 8 with an average 5.38 and standard deviation was 1.50. On the basis of their family size, the farmers were classified into three categories namely, small family (up to 4), medium family (5 to 6) and large family (7 and above) (Table 4.1). Data presented in Table 4.1 reveal that the highest proportion 38.4 percent of the farmers fell under medium family category compared to 35.6 percent small family and remain 26 percent with large family.

From the above findings it could observe that large family reduces and smaller to medium sized family increases day by day in the study area. Hossain (2010) and Burhan (2009) found average family size 5.50 which were almost similar to this study.

4.1.4 Farm size

The farm size of the farmers in the study area ranged from 0.194 to 0.802 hectares. The average farm size was 0.45 hectares with standard deviation 0.11 hectares. On the basis of their farm size score, the farmers were classified into five categories namely, landless (up to 0.02 ha), marginal (0.02 ha to 0.199 ha), small (0.2 ha to 0.99 ha), medium (1.0 ha to 3.0 ha) and high (above 3.0 ha) (Table 4.1). The highest proportion (99 percent) of the farmers fell in small sized farm, while only 1 percent farmers were marginal.

As the criteria of the participating farmers were having smaller farm most of the farmers of this study found smaller farm sized.

4.1.5 Annual family income

Annual family income scores of the farmers ranged from 52.70 thousand to 124 thousand with an average 88.21 thousand and standard deviation 16.57 thousand. Based on their family

income score, farmers were classified into three categories namely, low income (up to 75), medium income (75 to 100) and high income (above 100) (Table 4.1). Highest proportion of the farmers (43.3 percent) had medium annual income, 27.9 percent had low annual income and 28.8 percent had high annual income.

Findings indicate that 71.2 percent of the farmers' family in the study area constituted medium to low categories of income. Farmers should involve different income generating activities for their better livelihood.

4.1.6 Training exposure

The training exposure of the respondents ranged from 0 to 8 with an average of 3.51 and standard deviation of 3.07 (Table 4.1). On the basis of training exposure, the respondents were categorized into four categories no training (0), short training (1 to 4), medium (5 to 6), and high training received (above 6). Data presented in Table 4.1 indicate that 39.4 percent farmer had no training, 8.7 percent of them had short training, 33.7 percent had medium training and 18.2 percent farmer had high training reception.

Findings indicate that about 60 percent of the farmers' had at least some training on agriculture. As training enhances the knowledge and attitude level of the farmers it would help them for better crop production.

4.1.7 Organizational participation

The computed organizational participation score of the farmers ranged from 10 to 31, the average being 20.96 and standard deviation 4.81. On the basis of computed scores, the farmers were classified into four categories namely, no participation (0), low participation (up to 15), medium participation (15 to 25) and high participation (above 25). Data presented in the Table 4.1 reveals that highest proportion (66.4 percent) of the farmers had medium participation, while 16.3 percent of the farmers had low participation in organization and 17.3 percent of the farmers had high participation in organization.

Findings indicate that the farmers' of the study area were involved with various organizations.

4.1.8 Extension media contact

The computed extension media contact score of the farmers ranged from 11 to 29 with an average 19.0 and a standard deviation of 3.79. Table 4.1 contains the distribution of farmers according to their extension media contact as low (up to 14), medium (15 to 23) and high (above 23). The majority (71.2 percent) of the farmers had medium media contact, while 11.5

percent of them had low media contact. The proportion of farmers having high media contact was 17.3 percent. Thus, 82.7 percent of the farmers had low to medium contact with different media.

4.1.9 Agricultural knowledge

The computed scores of agricultural knowledge of the farmers ranged from 19 to 32. The average score being 25.62 and standard deviation was 3.00 shown in table 4.1. Based on these scores, the farmers were distributed into three categories namely poor knowledge (up to 22), fair knowledge (22 to 28) and good knowledge (above 28) (Table 4.1). Table 4.1 shows that more than three fifth (63.5 percent) of the farmers had fair agricultural knowledge compared to 21.2 percent having poor agricultural knowledge and 15.3 percent had good agricultural knowledge.

Thus, in general, the knowledge level of the farmers of the study area was satisfactory. Agricultural knowledge plays a vital role on different inputs of agriculture which ultimately leads better farming.

4.2 Attitude of the Farmers towards the Use of *Dolochun* for Crop Production

Farmers' attitude towards use of *dolochun* for crop production was quantified by computing scores for their attitude. These scores of the farmers' could range from 12 to 60 where 12 indicating highly unfavorable attitude and 60 indicating highly favorable attitude. Computed scores of the farmers' ranged from 36 to 56 and the average was 46.25 with a standard deviation of 5.15. On the basis of computed scores, the farmers' were classified into the following three categories as slightly favorable (up to 41), moderately favorable (41 to 50) and highly favorable (above 50) Table 4.2.

Table 4.2 Distribution of farmers according to their attitude towards the use of *dolochun* for crop production

Range		Categories	Respondents		Mean	SD
Possible	Observed		Number	Percent		
12-60	36-56	Slightly favorable (up to 41)	20	19.2	46.25	5.15
		Moderately favorable (41 to 50)	61	58.7		
		Highly favorable (above 50)	23	22.1		
		Total	104	100.0		

Table 4.2 indicates that the highest proportion (58.7 percent) of farmers' had moderately favorable attitude, while 22.1 percent and 19.2 percent had highly favorable attitude and slightly favorable attitude towards the use of *dolochun* for crop production. It is found that the majority of the respondent showed moderately favorable attitude.

4.3 Relationships between the Selected Characteristics of the Farmers and their Attitude towards the Use of *Dolochun* for Crop Production

This section deals with the relationships between the nine selected (independent variables; i.e. age, educational qualification, family size, farm size, annual family income, training exposure, organizational participation, extension media contact and agricultural knowledge) characteristics of the farmers and their attitude towards use of *dolochun* for crop production (dependent variable).

Pearson's Product Moment co-efficient of correlation (r) was used to determine the relationship between the selected independent and dependent variables and to accept or reject the null hypothesis. Five percent (0.05) and one percent (0.01) level of significance was used as the basis for acceptance or rejection of a null hypothesis. A summary of the correlation analysis is presented in Table 4.3.

Table 4.3 Relationships between the dependent and independent variables

Dependent variable	Independent variables	Correlation coefficient (r)
Attitude towards <i>dolochun</i>	Age	-0.293**
	Educational qualification	0.369**
	Family size	-0.272**
	Farm size	0.048
	Annual family income	0.042
	Training exposure	0.726**
	Organizational participation	0.408**
	Extension media contact	0.597**
	Agricultural knowledge	0.737**

** indicating significant at the 5% level and *** indicating significant at 1% level

4.3.1 Age and attitude towards the use of *dolochun*

The computed correlation coefficient between age of the participants and their attitude towards the use of *dolochun* was -0.293, which was negatively significant at 1 percent level of significance (Table 4.3). Hence, the concerned null hypothesis could be rejected. Thus, it could be stated that there was significant negative relation between the age of the participants and their attitude towards *dolochun*. The findings indicate that, there was a negative trend between age of the participants and their attitude. It means that, the lower the age of the farmers, the more favorable the attitude towards the use of *dolochun* for crop production. The researcher found that, in the study area relatively younger's had more favorable attitude towards use of *dolochun* for crop production than the older.

4.3.2 Educational qualification and attitude towards the use of *dolochun*

The correlation coefficient for educational qualification and attitude of the farmer towards the use of *dolochun* was 0.369 which was significant at 1 percent level of significance (Table 4.3) Therefore, the concerned null hypothesis was rejected. It was, therefore, concluded that educational qualification of the farmers had significant positive relationship with their attitude towards *dolochun*. It means that, the farmers who had more educational qualification was more logical and may get suitable information for solving their various kinds of problems and also had more favorable attitude towards *dolochun*. Education helps individual to gain knowledge and skills in different cognitive levels and thus develop positive attitudes. It makes them capable of getting useful information to solve everyday working problem.

4.3.3 Family size and attitude towards the use of *dolochun*

The computed correlation coefficient between family size of the participants and their attitude towards the use of *dolochun* was -0.272, which was negatively significant at 1 percent level of significance (Table 4.3). Hence, the concerned null hypothesis could be rejected. Thus, it could be showed that there was significant negative relation between the family size of the participants and their attitude towards *dolochun*. This means that, the farmers having small family become more favorable attitude towards the use of *dolochun* for crop production.

4.3.4 Farm size and attitude towards the use of *dolochun*

The computed correlation coefficient between farm size of the participants and their attitude towards the use of *dolochun* was 0.048, which was not significant at 5 percent level of significance (Table 4.3). Hence, the concerned null hypothesis could not be rejected. Thus, it

could be showed that there was a positive relation between the farm size of the farmers and their attitude towards *dolochun*, although this is not statistically significant.

4.3.5 Annual family income and attitude towards the use of *dolochun*

The computed correlation coefficient between annual family income of the participants and their attitude towards the use of *dolochun* was 0.042, which was not significant at 5 percent level of significance (Table 4.3). Hence, the concerned null hypothesis could not be rejected. Thus, it could be concluded that there was a positive relation between the annual family income of the participants and their attitude towards *dolochun*. This means that, annual family income had no influence to form their attitude towards use of *dolochun* for crop production.

4.3.6 Training exposure and attitude towards the use of *dolochun*

The computed correlation coefficient between training exposure of the participants and their attitude towards the use of *dolochun* was 0.726, which was positively significant at 1 percent level of significance (Table 4.3). Hence, the concerned null hypothesis could be rejected. Thus, it could be showed that there was significant positive relation between the training exposure of the participants and their attitude towards *dolochun*. Based on the above findings it implies that training exposure of the farmers was directly related to their attitude towards the use of *dolochun* for crop production. Training exposure of the farmers is an important factor that contributes ones development in various fields including knowledge and practices.

4.3.7 Organizational participation and attitude towards the use of *dolochun*

The computed correlation coefficient between organizational participation of the participants and their attitude towards the use of *dolochun* was 0.408, which was positively significant at 1 percent level of significance (Table 4.3). Hence, the concerned null hypothesis could be rejected. Thus, it could be showed that there was positively significant relation between the organizational participation of the participants and their attitude towards the use of *dolochun*. It also indicated that, the farmers who were involved with various organizations hold more favorable attitude towards the use of *dolochun*. Organizational participation makes them able to understand about the social, economical, environmental and political issues. It also creates awareness of the farmers about the use of *dolochun* for crop production.

4.3.8 Extension media contact and attitude towards the use of *dolochun*

The computed correlation coefficient between extension media contact of the participants and their attitude towards the use of *dolochun* was 0.597, which was positively significant at 1

percent level of significance (Table 4.3). Hence, the concerned null hypothesis could be rejected. Thus, it could be concluded that there was positively significant relation between the extension media contact of the participants and their attitude towards use of *dolochun*. This finding indicates that, the extension media contact of the farmers, facilitate to form more favorable attitude towards the use of *dolochun*. The farmers, who maintain comparatively good contact with extension media, obtained better agricultural knowledge and other information's. Agricultural extension enhances the efficiency of making adoption decisions.

4.3.9 Agricultural knowledge and attitude towards the use of *dolochun*

The computed correlation coefficient between agricultural knowledge of the participants and their attitude towards the use of *dolochun* was 0.737, which was positively significant at 1 percent level of significance (Table 4.3). Hence, the concerned null hypothesis could be rejected. Thus, it could be showed that there was positively significant relationship between the agricultural knowledge of the participants and their attitude towards the use of *dolochun*. It means that, more agricultural knowledge of the farmers, the attitude become more favorable. Agricultural knowledge makes them able to understand, practice and develop skills in various aspect of the use of *dolochun*. Knowledge is one of the most important factors for developing perception as well as skills of a person. It widens the outlook of a person that he may easily understand the crucial factor to have the success in any work.

4.4 Constraints Faced by the Farmers in Adopting *Dolochun*

There was an open question in interview schedule to know the constraints faced by the farmers' in adopting *dolochun*. The results are presented in Table 4.4.

Table 4.4 Distribution of the constraints faced by the farmers' in adopting *dolochun* and their ranked

Constraints	No. of citation	Ranked
Unavailability of <i>dolochun</i> at pick period	75	1 st
Lack of knowledge about <i>dolochun</i>	65	2 nd
Ignorance of farmers about the advantage of <i>dolochun</i>	42	3 rd
Lack of training of farmers in using <i>dolochun</i>	35	4 th

It is evident from Table 4.4 that majority of the respondents had expressed that, 'Unavailability of *dolochun* at pick period' and was ranked first. 'Lack of knowledge about *dolochun*' was ranked second. 'Ignorance of farmers about the advantage of *dolochun*' was the third constraints of the farmers and ranked 3rd in the table because there was a large communication gap between the farmers and the service provider. 'Lack of training of farmers in using *dolochun*' as the fourth constraints in the ranked.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Findings

The study was conducted to determine some selected characteristics of the farmers using *dolochun*, to determine the attitude of respondents towards the use of *dolochun* for crop production, to determine the relationship between the selected characteristics of the farmers and their attitude towards *dolochun* and to identify the constraints faced by the farmers in adopting *dolochun*. The research was done in three unions of Domar upazila under Nilphamari district. From an updated list of 310 farmers, 104 (about 34 percent) respondents were selected as sample using random sampling method. Data were collected from the study area during 15th April to 25th June, 2014 using structured questionnaire. A summary of the major findings are given below:

5.1.1 Selected characteristics of the farmers

The **age** of the respondents was ranged from 24 to 57 years. The average being 39.59 years with a standard deviation of 8.34 years. About fifty percent (49 percent) of respondents were in the middle aged category followed by 39.5 percent and 11.5 percent under young and old categories respectively.

The observed score of **educational qualification** ranged from 0 to 9. The mean and standard deviation were 2.42 and 3.10, respectively. Highest proportion (36.5 percent) of farmers can sign only compared to 28.8 percent were illiterate, 14.5 percent had primary education and 20.2 percent had secondary education.

The **family size** of the respondents ranged from 3 to 8 with an average and standard deviation of 5.38 and 1.50, respectively. Majority of the respondents (38.4 percent) fall under the medium family size category compared to 26 percent small and 35.6 percent large family size categories. Thus 64.4 percent of the farmers had small to medium family size.

Farm size varied from 0.194 to .802 hectares. The mean value of farm size was 0.45 hectares with a standard deviation of 0.11 hectares. Ninety nine percent of the respondents are under small sized farms category and only 1 percent had marginal farm sized.

Annual family income of the respondents ranged from 52.70 thousand taka to 124 thousand taka with the mean of 88.21 thousand and standard deviation 16.57 thousand.

About 27.9 percent of the farmers had high annual family income, while 43.3 percent had medium and 28.8 percent had low annual family income.

The **training exposure** scores of the respondents ranged from 0 to 8 with a mean and standard deviation of 3.51 and 3.07, respectively. Around 39.4 percent of the respondents had no training, 8.7 percent of the respondents had short training, 33.7 percent had medium training and 18.2 percent had high training.

Organizational participation of the farmers ranged from 10-31 with a mean and standard deviation of 20.96 and 4.81, respectively. The largest proportion (66.4 percent) of the farmers had medium organizational participation and 16.3 percent of the farmers had low organizational participation, compared to 17.3 percent had high organizational participation.

Extension media contact of the farmers ranged from 11 to 29 with a mean and standard deviation 19 and 3.79, respectively. About three-fourth (71.2 percent) of the farmers fell in the medium category of extension media contact, as compared to 11.5 percent fell in low and 17.3 percent in the high category.

Agricultural knowledge of the farmers ranged from 19 to 32 with a mean and standard deviation 25.62 and 3.00 respectively. The highest proportion (63.5 percent) of the farmers had fair agricultural knowledge, as compared to about 21.2 percent had poor agricultural knowledge and 15.4 percent had high agricultural knowledge.

5.1.2 Attitude of the farmers towards the use of *dolochun* for crop production

Attitude towards the use of *dolochun* for crop production scores could range from 12 to 60. Computed scores of the farmers' ranged from 36 to 56 and the average was 46.25 with a standard deviation of 5.15. Highest proportion (58.7 percent) of the farmers had 'moderately favorable' while 19.2 percent and 22.1 percent had 'slightly favorable' and 'highly favorable' attitude towards the use of *dolochun* for crop production, respectively.

5.1.3 Relationships between selected characteristics of the farmers and their attitude towards the use of *dolochun* for crop production

The results of the hypotheses testing between the selected characteristics of the farmers and their attitude towards the use of *dolochun* for crop production have been discussed below:

The null hypothesis was rejected on the basis of estimated 'r' value at 0.01 level of probability. Hence, the researcher concluded that educational qualification, training exposure,

organizational participation, extension media contact and agricultural knowledge of the respondents had positively significant relationships with their attitude towards the use of *dolochun* for crop production. On the other hand, age and family size of the respondents had negatively significant relationships with their attitude towards the use of *dolochun* for crop production.

The null hypothesis was not rejected on the basis of estimated value 'r' at 0.05 levels of probability. So, the researcher concluded that farm size and annual family income of the farmers had positive relationships with their attitude towards the use of *dolochun* for crop production.

5.1.4 Constraints faced by the farmers in using *dolochun*

The most serious problem faced by majority of the farmers was "unavailability of *dolochun* at pick period". The second and third constraints faced by them were "lack of knowledge about *dolochun*" and "ignorance of farmers about the advantage of *dolochun*", respectively.

5.2 Conclusions

Based on the findings of the study and logical interpretation of the findings the following conclusions have been made:

1. The highest proportion of the farmers had 'moderately favorable' attitude towards the use of *dolochun* for crop production. Thus, favorable attitude of the farmers may be well utilized for the adoption of *dolochun* for crop production.
2. The findings of the study revealed that about three-fourths of the farmers in the study area had at least some education; most of the farmers had participation in different organization and extension media, having at least some knowledge on different agricultural activities. These farmers to the same extent are ready to take innovation in their field.
3. Correlation test showed that educational qualification, training exposure, organizational participation, extension media contact and agricultural knowledge of the respondents had positively significant relationships with their attitude towards the use of *dolochun* for crop production. Therefore, it can be concluded that these characteristics of the farmers have good link with their attitude towards the use of *dolochun* for crop production.

4. The findings indicated that four constraints were identified (“unavailability of *dolochun* at pick period”, “lack of knowledge about *dolochun*”, “ignorance of farmers about the advantage of *dolochun*” and ‘Lack of training of farmers in using *dolochun*’ respectively) by the farmers in adopting *dolochun* for crop production. These problems impede the proper use of *dolochun*.

5.3 Recommendations

5.3.1 Recommendations for policy implication

In view of the above conclusions, the following recommendations are put forward.

1. In order to increase the use of *dolochun*, the farmers should have more favorable attitude towards it. So by creating functional relationship of action collaboration, co-operation and interdependence among the GOs and NGOs would be very helpful to develop over all attitudes of the farmers towards the use of *dolochun*.
2. To increase favorable attitude of the farmers towards the use of *dolochun*, DAE and other agricultural related organization should take necessary steps to popularize the use of *dolochun* by supplying extension materials and maintain contact with the farmers.
3. Education is a key point of attitude formation of the farmers towards the use of *dolochun* for crop production. So there should be provision for non-formal education program in the study area.

5.3.2 Recommendations for further study

A small piece of study cannot provide all the research information for proper understanding of attitude towards the use of *dolochun*, suggestions is put forward for further research:

1. The study was conducted only in three unions of Domar upazila under Nilphamari district. Findings may be verified by similar study in other parts of the country.
2. The study examined the relationships of nine selected characteristics of the farmers who use *dolochun* and their attitude towards use of *dolochun* for crop production. Therefore, it is recommended that further study may be undertaken involving other different independent variables in this regard.

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APPENDIX A

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An interview schedule on: Farmers attitude towards the Use of Dolochun for crop production

Serial No:

Mobile No.....

Name of the respondent.....Village.....

Union.....

(Please provide necessary information for the following issues)

1. Age: How old are you? Years

2. Education qualification: Please mention your level of education:

a) Can't read and write (.....)

b) Can sign only: (.....)

c) Have passed class: (.....)

3. Family Size: Please indicate the numbers of your family members:

a) Male.....

b) Female.....

Total.....

4. Farm Size: Please indicate area of your land according to use:

Sl. No.	Use	Local Unit	Hectare
1.	Homestead area		
2.	Own land under own cultivation		
3.	Area of land taken from others on lease		
4.	Area of land given to others as borga		
5.	Area of land taken from others as borga		
Total			

5. Annual family income: Please indicate the production and income of your family has earned last year from different sources:

Sl. No.	Source of income	Total Production (Kg)	Market price (Taka)	Total price (Taka)
A.	Agricultural sources			
1.	Crops			
	Rice			
	Wheat			
	Maize			
	Potato			
	Pulses			
	Mustard			
	Ground nut			
	Chilli			
2.	Fisheries			
3.	Livestock			
4.	Others			
B.	Non-agricultural sources			
1.	Service			
2.	Small business			
3.	Earning from wage work			
			Total	

6. Training exposure: Did you receive any training related to agricultural activities?

Yes..... No.....

If yes, then how many days? Ans.....

10. Attitude towards the use of *dolochun*: Please indicate your opinion in respect of the following statements.

SL No.	Statements	Extent of opinion				
		SA	A	UD	DA	SDA
1. (+)	It is certain that application <i>dolochun</i> reduces soil acidity and increases crop production					
2. (-)	It is difficult maintain the rate of <i>dolochun</i> on the field					
3. (+)	Application of <i>dolochun</i> helps to reduce the infestation of pest and disease					
4. (-)	<i>Dolochun</i> is a costly possession					
5. (+)	I feel that, by applying <i>dolochun</i> crop yield is increased than non lime field					
6. (-)	<i>Dolochun</i> is not suitable for all types of crops					
7.(+)	Application of <i>dolochun</i> improves long term crop productivity of the field					
8. (-)	Application of <i>dolochun</i> does not ensure of good returns throughout the year;					
9. (+)	I feel that application of <i>dolochun</i> is necessary to maintain soil health					
10. (-)	Selection of land for <i>dolochun</i> application is a bit difficult task					
11.(+)	Application of <i>dolochun</i> helps to reduce some disease					
12. (-)	<i>Dolochun</i> is not suitable for all types of soil					

Note: SA= Strongly Agreed, A= Agreed, UD= Undecided, D= Disagreed, SD= Strongly Disagreed

11. Constraints faced by the farmers in adopting *dolochun*:

Please mention the problems you are encountered in applying *dolochun* on crop field.

- 1)
- 2)
- 3)
- 4)
- 5)

.....

Thanks for your kind co-operations

Signature of the interviewer with date

APPENDIX B

Correlation matrix between independent and dependent variable

Characteristics	Age	Educational qualification	Family size	Farm size	Annual family income	Training exposure	Organizational participation	Extension media contact	Agricultural knowledge	Attitude towards <i>dolochun</i>
Age	1									
Educational qualification	-0.346**	1								
Family size	0.866**	-0.394**	1							
Farm size	0.345**	-0.027	0.163	1						
Annual family income	0.339**	0.058	0.323**	0.266**	1					
Training exposure	-0.254**	0.471**	-0.303**	0.034	0.020	1				
Organizational participation	0.126	0.106	0.045	0.116	0.031	0.460**	1			
Extension media contact	-0.014	0.343**	-0.067	0.109	0.168	0.585**	0.254**	1		
Agricultural knowledge	-0.310**	0.500**	-0.385**	0.161	0.082	0.760**	0.383**	0.608**	1	
Attitude towards <i>dolochun</i>	-0.293	0.369**	-0.272**	0.048	0.042	0.726**	0.408**	0.597**	0.737**	1

* Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed)