

**ADOPTION OF MODERN JUTE CULTIVATION PRACTICES BY
THE FARMERS OF GAIBANDHA DISTRICT**

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**ADOPTION OF MODERN JUTE CULTIVATION PRACTICES BY
THE FARMERS OF GAIBANDHA DISTRICT**

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CERTIFICATE

This is to certify that the thesis entitled “ADOPTION OF MODERN JUTE CULTIVATION PRACTICES BY THE FARMERS OF GAIBANDHA DISTRICT” submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of Master of Science in Agricultural Extension and Information System, embodies the result of a piece of bona fide research work carried out by Md. Fuad Kabir, Registration No. 11-04294 Under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

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

*Dated:
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Dedicated To

My Beloved Parents

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ACRONYMS AND ABBREVIATIONS

| | |
|-------------------------|---|
| Ag. Ext. and Info. Sys. | Agricultural Extension and Information System |
| AIS | Agriculture Information Service |
| BAU | Bangladesh Agricultural University |
| BBS | Bangladesh Bureau of Statistics |
| BRRI | Bangladesh Rice Research Institute |
| DAE | Department of Agriculture Extension |
| DAE | Department of Agricultural Extension |
| et. al | All Others |
| etc. | et cetera, and the other |
| FAO | Food and Agriculture Organization |
| MoYS | Ministry of Youth and Sports |
| SAAO | Sub-Assistant Agriculture Officer |
| SAU | Sher-E-Bangla Agricultural University |
| df | Degrees of Freedom |
| NS | Non Significant |
| % | Percent |
| Fig | Figure |
| Kg | Kilogram |
| @ | at the rate of |

ADOPTION OF MODERN JUTE CULTIVATION PRACTICES BY THE FARMERS OF GAIBANDHA DISTRICT

By

Md. Fuad Kabir

ABSTRACT

The purpose of the study was to determine and describe the extent of adoption of modern jute cultivation practices by the farmers. Attempts were also made to describe some of the selected characteristics of the farmers and to explore the relationships between the selected characteristics and their adoption of modern jute cultivation practices. The study was conducted at five villages namely; Nandina, Daulutpur, Mirpur, Sonaidanga and Modhupur under Gaibandha sadar Upazila under Gaibandha District. Data were collected from 103 farmers who were randomly selected as the sample of the study by using random sampling method. The researcher himself collected data through personal contact with a well-structured pretested interview schedule during the period from 16 January to 04 February 2019. The findings revealed that highest 65.0 percent of the respondents had medium adoption of modern jute cultivation practices, while 19.4 percent had low adoption and the rest 15.5 percent had high adoption of modern jute cultivation practices. Pearson's Product Moment Correlation co-efficient (r) was computed to explore the relationships between the selected characteristics and their adoption of modern jute cultivation practices. The correlation analysis indicated that education, income from jute, organizational participation, Extension media contact, knowledge on modern jute cultivation practices and attitude towards modern jute cultivation practices had significant positive relationships with the adoption of modern jute cultivation practices. Age, Farm size, Annual income and Cosmopolitaness had no significant relationships with the adoption of modern jute cultivation practices.

CHAPTER I

INTRODUCTION

1.1 General Background

Jute is a long, soft, shiny vegetable fibre that can be spun into coarse, strong threads. Jute is a natural fibre popularly known as the golden fibre. It is one of the cheapest and the strongest of all natural fibres. The jute fibre is also known as Pat. It is produced primarily from plants in the genus *Corchorus*, which was once classified with the family Tiliaceae, and more recently with Malvaceae. The primary source of the fibre is *Corchorusolitorius*, but it is considered inferior to *Corchoruscapsularis*. Jute is the name of the plant offibre used to make burlap, hessian or gunny cloth.

Jute fibres are composed primarily of the plant materials cellulose and lignin. It falls into the bastfibre category (fibre collected from bast, the phloem of the plant, sometimes called the "skin") along with kenaf, industrial hemp, flax (linen), ramie, etc. The industrial term for jute fibre is raw jute. The fibres are off-white to brown, and 1–4 metres (3–13 feet) long. Jute is also called the golden fibre for its color and high cash value.

It is grown in Bangladesh, India, Myanmar, Nepal, China, Taiwan, Thailand, Vietnam, Cambodia, Brazil and some other countries. Bangladesh used to enjoy almost a monopoly of this fibre commercially; its share in the export market was 80% in 1910-48 but in 1975-76 it fell to only 25% (Banglapedia). This fall in the world market was due to the fact that many countries had started growing jute and allied fibres. The substitutes of jute are multiwalled paper bags, poly-propelin, polythylene, and natural fibres from kenaf, hemp, sida, sunhemp, etc. Jute fibres are used in hessians and gunnies, carpet and rugs, paper, canvas, tarpaulin, handicrafts, etc. Dundi (UK) purchases high class jute of all grades, particularly white and tossa. Belgium, Italy, USA, South America are the buyers of superior quality jute. Jute was cultivated in ancient times in Bengal. (Banglapedia)

Bangladesh has plenty of low lands that go under water during rainy season. Eighty percent of the world's high quality jute grows in Bangladesh. Jute has been cultivated in Bangladesh from the time immemorial but no one can say exactly when or from where it came. However, from the available records it is found that jute began to be commercially cultivated in 1828 and it started to be produced on a large scale from 1865. It is said that Bangladesh was the

first jute producing country in the world (Ahmed, 1968). But at present, jute production has tremendously declined. India produces the highest quantity of jute in the world . In Bangladesh greater Mymensingh and Faridpur, Dhaka, Comilla, Rangpur and Jessore are the major jute growing districts. Other jute growing countries are India, China, Nepal, Thailand, Pakistan, Mexico etc. (IJO 1993/94). There are around 40 species of jute in Bangladesh. The farmers of this country, however, grow mainly two species of jute commercially such as:

(i) *Corchoruscapsularis*(White or Deshi jute).

(ii) *Corchorusolitorius*(Tossa or boghi jute).

It may be noted here that there is another variety of jute grown in the country which is locally called “Mesta” but its hectare age is negligible.

Cultivation largely depends upon pre-monsoon showers and moisture conditions. *C. capsularis* is more water tolerant and thus generally can be grown in low lands, and even under water logging conditions, while *C. olitorius* is more susceptible to water logging and hence cultivated in medium to lower medium lands. Jute can be grown in a number of soil types, ranging from clay to sandy loam with optimum fertility, and soil pH ranging from 6.5-7.5 (Roy, 2017). Jute is basically self-pollinated and has fourteen diploid chromosomes. It needs long day light for growth. After sowing, four to five months are needed for harvesting of crops. This is done at the flowering stage. The fibre is obtained from the bast or phloem layer of the stem. Jute cultivation is labour intensive and is mostly grown by marginal, poor, and small landowners. For successful cultivation, land preparation is very important. It needs 3-5 times cross ploughing and laddering for uniform smooth soil, which must have more than 20% organic content. Cow dung is generally used, along with NPK in appropriate proportion, according to the soil type. In Bangladesh farmers generally do not use any fertilizer in jute cultivation. However, when used it must be applied in three stages; one at land preparation, and two as top dressing at appropriate time. During cultivation weeding is usually done in addition to thinning.

Generally, 7-10 kg/ha seed (Roy, 2017) is sown by the broadcasting method. In line sowing, lower amount of seeds is required. Traditionally, farmers keep a small part of the crop area for growing seeds until the seeds mature in October/November. After harvesting, plants are bundled together with required number of plants, and kept standing for 5-7 days in the field for shading off the leaves. Then the bundles are put under water. Clear slow flowing water is

the best thing possible for good retting. After 15-20 days (Rostom, 2015), when proper retting is completed, the fibre is separated from the stick by hand and then washed and dried in sunlight. After drying, farmers sell the fibre in the local market.

Although jute is grown in almost all the districts of Bangladesh, Faridpur, Tangail, Jessore, Dhaka, Sirajganj, Bogra, and Jamalpur are considered the better growing areas. Total area under the crop is estimated to be 559,838 ha and the total production about 5310,500 bales. Bangladesh Jute Research Institute (BJRI) so far has developed about 27 high-yielding and good quality jute cultivars (Banglapedia). Such as BJRI tossa-5, BJRI tossa-8, BJRI deshi-7.

Jute products and jute-based products are put to a wide range of uses. Since antiquity it has been used as a raw material for packaging. Before being used as a commercial commodity it was used in different parts of the world to make household and farm implements such as ropes, handmade clothes, wall hangings, etc.

In Bengal sacks and saris made of jute were commonly used in the Middle Age. Export of sacks started in the 18th century. Its leaves and roots were used as herbal medicine, and as vegetable by the local people. Its use as an industrial commodity began in the Crimean war when it was used as a substitute of flax. Its use was popularized primarily in Western Europe, particularly at Dundee. Traditionally, use of jute products are limited to packaging materials like twine, hessian, gunny bag, twill, carpet backing, wool pack, tarpaulin, mats, canvas, wall cover, upholstery, and as furnishing fabrics of different types and natures. Production of jute was high before 70 decade after that the production of jute decreasing for many reason. At present the production of jute is increasing day by day due to modern cultivation practices and its environment effects.

1.2 Justification of the Study:

Jute remains relatively neglected comparing to production aspects in Bangladesh. This neglect is unfortunate since jute being a cash crop and one of the principal sources of cash income for farmers; its production solely depends on its national and international marketing policy. There is no other alternative fibre yielding or cereal crop that can be produced in excess to earn foreign exchange to the extent as jute has been earning since long past. The contribution of jute is being shifted to the marginal land. Jute has been facing as acute competition both

within the country by the Aus rice cultivation and outside by synthetic fibre. Consequently, there has been a marked reduction in demand of raw jute fibre and acreage of jute cultivation. In order to save jute cultivation or production from inside and outside threat, the extension service must launch a countrywide campaign to produce quality jute at a relatively low cost per hectare. Perhaps, this is possible only through large-scale adoption of improved technologies. It refers to the use of improved seed, line sowing method, ribbon retting method, proper land preparation and proper weeding technologies. On the basis of the findings of the present study specific recommendations will be made for realistic policy formulation which will help to increase knowledge and change attitude of the jute growers and also to improve their jute cultivation practices.

1.3 Statement of the problem:

In perspective on the previous discourse, the researcher under took a bit of concentrate entitled, “Adoption of Modern jute cultivation practices by the Farmers of Gaibandha District”. This research information are required which could be helpful to the policy maker, concerned bodies with the supply of inputs, technologies, knowledge and confronted with several problems having solution.

The study also aimed at finding out those factors, which facilitated as well as those, which caused barriers to the adoption of modern jute cultivation practices by the farmers.

The purpose of this study was to have answers to the following research questions:

- What are the characteristics of jute growers?
- What is the extent of adaption of modern jute cultivation practices?
- Is there any relationship between the farmers’ selected characteristics and their adoption of modem Jute Cultivation Practices?

1.4 Specific objectives:

The following specific objectives were set forth in order to proper direction to the study:

1. To identify and describe some selected characteristics of jute growers. The selected characteristics were:

- Age,
 - Education,
 - Farm size,
 - Annual family income,
 - Income from jute,
 - Organization participation,
 - Cosmopolitaness,
 - Extension contact,
 - Knowledge on modern jute cultivation practices,
 - Attitude towards modern jute cultivation practices
2. To assess the adoption of use of improved seed, line sowing method and ribbon retting method.
 3. To explore the relationships between the selected characteristics of the farmers and their adoption of modern jute cultivation practices.

1.5 Assumption of the Study

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

1. The selected respondents were competent enough to reply the queries made by the researcher.
2. The responses furnished by the respondents were valid and reliable.
3. Information furnished by the respondents included in the sample was the representative opinion of the whole population of the study area.
4. The researcher who acted as interviewer was well adjusted to social and environmental condition of the study area. Hence, the data collected by him from the respondents were free from bias.

1.6 Limitation of the Study

In order to make the study manageable and meaningful from the point of view of research, it was necessary to state the limitations of this study, which are given as follows:

1. The study was confined to five selected villages of Gaibandhasadarupazila under Gaibandha district.
2. The characteristics of the respondents farmers in the study area were many and varied but only 10 characteristics were selected for examining their relationship on their adaption regarding modern jute cultivation practices.
3. The researcher relied on the data furnished by the jute farmers' from their memory during interview.
4. For some cases, the researcher faced unexpected interference from the over interested side-talkers while collecting data from the target populations. However, the researcher tried to overcome the problem as far as possible with sufficient tact and skill.

1.7 Definition of Related Terms

In this section, the terms which have been frequently used throughout the thesis are defined and interpreted below:

Farmers/Growers

The persons who were involved in farming activities are called farmers. They participated in different farm and community level activities like crops, livestock, fisheries, and other farming activities.

Respondents

Individuals who answer questions approached by a questioner for a social study. They are the general population from whom a social research laborer normally gets most information required for his examination.

Extension agent

The extension agent has to work with people in a variety of different ways. It is often an intimate relationship and one which demands much tact and resourcefulness. The agent inevitably works with people whose circumstances are different from his own. He is an educated, trained professional working with farmers, many of whom have little formal education and lead a way of life which may be quite different from his.

Adoption Process

Innovation-decision is a psychological process through which an individual of a social system engages in mental activities just from first hearing about an innovation to its final adoption. The entire process consists of five stages viz.; knowledge, persuasion, decision, implementation and confirmation (Bhuiyan, 2012). 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).

Attitude

An attitude refers to a set of emotions, beliefs, and behaviors toward a particular object, person, thing, or event. Attitudes are often the result of experience or upbringing, and they can have a powerful influence over behavior.

Knowledge on modern jute cultivation practices

It referred to the extent of basic understanding of the farmers in different aspects of modern jute cultivation practices i.e. varieties, soil condition, use of improve seed, seed rate, suitable time for cultivation, fertilizers, diseases, insects, fungicides, harvesting time, retting method etc.

Extension contact

It refers to an individual's (farmer) exposure to or contact with different communication media, source and personalities being used for dissemination of new technologies.

Improved seed

Improved seed is defined as varietally pure with a high germination percentage, free from disease and disease organisms, and with a proper moisture content and weight. Improved seed insures good germination, rapid emergence, and vigorous growth.

Ribbon retting

Ribbon retting is a technique to solve the problem of jute retting in water scarce areas. With this technology it is now possible to get high quality fibre by retting the peeled barks (instead of whole plants) in very shallow ditches or even in big earthenware.

CHAPTER II

REVIEW OF LITERATURE

In this section writings important to the present study were checked on. Data concerning the related study was gotten by assessing proposition, books, distributions, diaries, reports and magazines and seeking web. While looking through these sources, the creator couldn't discover any examination on the degree of selection of present day jute by the researchers. A couple of research works have been done in a roundabout way identified with the investigation. This chapter comprises of four sections.

- First section dealt with concept of diffusion, adoption and innovation-decision process.
- Second section reviewed the literature of findings researches on adoption.
- Third section dealt with relationship between selected characteristics of the farmers with their adoption of jute cultivation. And
- The final section dealt with the conceptual framework of the study.

2.1 Concept of Diffusion, Adoption and Innovation-Decision Process

The idea of dissemination was first concentrated by the French humanist Gabriel Tarde (1890) and by German and Austrian anthropologists, for example, Friedrich Ratzel and Leo Frobenius. Its essential epidemiological or inner impact structure was defined by H. Baron Pemberton, who gave instances of institutional dissemination, for example, postage stamps and institutionalized school ethic codes. (Wikipedia)

In 1962 Everett Rogers, a professor of rural sociology distributed his work: "Dispersion of Innovations". In this original piece, Rogers combined research from more than 508 dispersion thinks about and created a hypothesis connected to the selection of developments among people and associations.

Rogers' work states that 4 principle components impact the spread of another thought: the advancement, correspondence channels, time, and a social framework. These components work related to each other: dispersion is the procedure by which an advancement is conveyed

through specific channels after some time among the individuals from a social framework. Rogers adds that fundamental to this hypothesis is process.

Difference between Diffusion and Adoption

Adoption is an individual procedure enumerating the arrangement of stages one experiences from first catching wind of an item to at last receiving it. The stages are Awareness, Interest, Evaluation, Trial, and Adoption. The diffusion procedure, be that as it may, means a gathering of wonders, which proposes how an advancement spreads among customers. Generally, the diffusion procedure basically includes the adoption procedure of a few people after some time.

Adoption process

Rogers and Shoemaker (1971) stated the adoption process as – the traditional view of the innovation decision process, called “adoption process” was postulated by a committee of rural sociologists in 1955 as consisting of five stages:

- **Awareness stage:** The individual learns of the presence of the new thought however needs subtleties data about it.
- **Interest stage:** The individual creates enthusiasm for the advancement and looks for extra data about it.
- **Evaluation stage:** The individual makes mental use of the new plan to his present and foreseen future circumstance and chooses whether or not attempt it.
- **Trail stage:** The individual really applies the new thought on a little scale so as to decide its utility in its own circumstance.
- **Adoption stage:**Te singular uses the new thought ceaselessly on a full scale.

Innovation-Decision process

Diffusion of an innovation occurs through a five–step process. This process is a type of decision-making. In later edition of the “Diffusion of Innovations” Rogers (1995) changed the terminology of the five stages to: knowledge, persuasion, decision, implementation, and confirmation. And the descriptions of five stages of the adoption process are as follows:

- **Knowledge Stage:** In this stage the individual is first presented to a development however needs data about the advancement. Amid this phase of the procedure the individual has not been enlivened to discover more data about the advancement.
- **Persuasion Stage:** In this stage the individual is keen on the development and effectively looks for data/insight regarding the advancement.
- **Decision Stage:** In this stage the individual takes the idea of the change and gauges the preferences/disservices of utilizing the development and chooses whether to receive or dismiss the advancement. Because of the individualistic idea of this stage Rogers takes note of that it is the most troublesome stage to obtain exact.
- **Implementation Stage:** In this stage the individual utilizes the development to a fluctuating degree relying upon the circumstance. Amid this stage the individual decides the handiness of the development and may look for additional data about it.
- **Confirmation Stage:** In this stage the individual settles his/her choice to keep utilizing the development. This stage is both intrapersonal (may cause subjective disharmony) and relational, affirmation the gathering has settled on the correct choice.

2.2 Review of Literature on General Context of Adoption

Hasan (2016) revealed that more than half of the respondents (56.1 percent) had medium adoption where 15.9 percent had low adoption and only 24.3 percent had high adoption of modern practices for rice cultivation. Afroz (2013) conducted a research on adoption of wheat cultivation at kazipur upazla of Sirajganj district she found highest 40.48 percent of the respondents had low adoption of wheat cultivation, while 34.92 percent had medium adoption and the rest 24.60 percent had high adoption of wheat cultivation. Islam (2007) found that majority (51 percent) of mixed farmers had low adoption of mixed crop cultivation while 9 percent farmers had high adoption at madaripur sadar upazila. In a research Hasan (2003) found that majority (60 percent) potato farmers had medium adoption of potato cultivation practices while 33 percent and 7 percent farmers had low and high adoption of potato

cultivation practices respectively. Rahman (2003) found that ninety seven percent of the pineapple growers adopted 2-4 intercrops viz, Zinger, turmeric, sweet ground and aroid in pineapple cultivation. Haque (2003) found that the majority (47 percent) of the maize growers had medium adoption of modern maize cultivation technologies while 28 percent had high adoption and 25 percent low adoption. Swinkels et al. (2002) studied assessing the adoption potential of hedgerow intercropping for improving soil fertility, in western Kenya. They conduct that the average cost of hedgerow intercropping was 10.5% (SD = 5.5) when based on returns to land and 17.5% (SD = 6.5) based on returns to labour. Fifth planted additional hedges and only 14% did so to improve soil fertility. It thus appears that the potential for its adoption as a soil fertility practices. Hedgerow intercropping appears to have greater adopter potential if its aim is to provide feed for an intensive dairy operation or for curbing soil erosion. Sardar (2002) studied on "adoption of IPM practices by the farmers under PETRRA Project of RDRS. He observed that majority (45.9 percent) of the farmers had medium, 38.3 percent had low and 15.8 percent had high adoption of IPM practices. Aurangojeb (2002) studied on the extent of adoption of integrated farming technology by the rural women in RDRS. He observed that the highest percent of rural women (64%) used high level, 28% of the women used medium level and only 8% used low level integrated homestead farming technologies. Haider et al. (2001) studied the adoption level of improved Package of practices for T. aman rice cultivation in Gouripur upazila of Mymensingh district. He found that the adoption level of farmers categories were 5 percent non adoption, 62 percent low adoption, 24.5 percent medium adopter and 8.5 percent high adopter. Vast majority (95 percent) of the farmers adopted MV programme of T. aman rice.

From above research it was found that, the researcher could not come to a unique decision on adoption and modern jute cultivation practices, which requires further research.

2.3 Review of past studies on the relationship between selected characteristics of the jute farmers with their adoption of modern jute cultivation practices

2.3.1 Age and adoption

Rahman (2015) found that the age of the farmers had positive significant relationship with their adoption of selected rice (BRRI dhan 51 & BRRI dhan 52) variety. Afroz (2013), Islam (2007), Islam (2007) found that the age of the farmers had no relationship between age and

adaption in their studies. Ahmed (2006) found that the age of the farmers had no significant relationship with their adoption of selected wheat varieties. Mahmud (2006) found that the age of the farmers had no significant relationship with their adoption of modern wheat cultivation technologies. Sardar (2002) found that the age of the farmers had positive significant negative correlation with their adoption of IPM practices. Aurangozeb (2002) observed that there was significant negative relationship between age and adoption of integrated homestead farming technologies.

From above research it was found that, the researcher could not come to a unique decision on farmers age and adoption of modern jute cultivation practices, which requires further research.

2.3.2 Education and adoption

Rahman (2013), Afroz (2013) and Islam (2007) found that the farmers level of education had positive significant relationship with adaption in their studies. Ahmed (2006) found that the education of the farmers had no significant relationship with their adoption of selected wheat varieties. Mahmud (2006) found that the education of the farmers had significant positive correlation with their adoption of modern wheat cultivation technologies. Sardar (2002) found that the education of the farmers had significant positive relationship with their adoption of IPM practices. Aurangozeb (2002) studied on the extent of adoption of integrated homestead farming technologies by the rural women in RDRS. He observed that there was positive relationship between education and adoption of integrated homestead farming technologies.

However, avobe circumstance we found that resercher could not found unified conclusion, so further research is required.

2.3.3 Farm size and adoption

Rabby (2014) found that the farm size of the farmers had positive significant relationship with farmers' attitude towards jute cultivation. Islam (2007) found that the farm size of the farmers had positive significant relationship with their adoption of selected rice (BRRI dhan 29) variety. Rahman (2015) Afroz (2013) and Islam (2007) found that the farm size of the farmers

had no relationship between farm size and adaption in their studies. Ahmed (2006) found that the farm size of the farmers had no significant relationship with their adoption of selected wheat varieties. Mahmud (2006) found that the farm size of the farmers had no significant correlation with their adoption of modern wheat cultivation technologies. Hossain (2006) found that farm size of the farmers had no significant relationship with their adoption of selected high yielding varieties of rice. Rahman (2001) conducted a study on knowledge, attitude and adoption of the farmers regarding Alok 6201 hybrid rice in Sadarupazila of Mymensingh district. He found that farm size of the farmers had significant and positive relationship with their adoption of Alok 6201 hybrid rice.

From the above research work it was clear that researchers could not come to a unified decision on farmers farm size and adoption of modern jute cultivation practices, which requires more research.

2.3.4 Annual family income and adoption

Rabby (2014) found that annual family income of the farmers had positive significant relationship with farmers' attitude towards jute cultivation. Islam (2007) and Islam (2007) found that the farmers annual family income had positive significant relationship with adaption in their studies. Ahmed (2006) found that the annual family income of the farmers had no significant relationship with their adoption of selected wheat varieties. Mahmud (2006) found that the annual income of the farmers had no significant correlation with their adoption of modern wheat cultivation technologies. Hossain (2003) revealed that family income of the farmers had a significant and positive relationship with their adoption of modern Boro rice cultivation practices.

Under above circumstance we hypothesized that there is a positive relationship between annual family income and adoption.

2.3.5 Income from jute and adoption

The researcher could not find any literature involving relationship between income from jute and adoption modern jute cultivation practices.

2.3.6 Organizational participation and adoption

Hossain (1971) study revealed a positive significant relationship of organizational participation of the farmers with their adoption of recommended doses of fertilizers and plant protection measures. He found positive significant relationship. Hossain (1983) in his study found that organizational participation of transplanted aman growers had no relationship with their adoption of HYV rice.

From the above research it was hypothesized that researchers found positive relationship between organizational participation and adoption.

2.3.7 Cosmopolitanism and adoption

Afroz (2013) and Islam (2007) found that the farmers' cosmopolitanism had positive significant relationship with adoption in their studies. Ahmed (2006) found that the cosmopolitanism of the farmers had significant positive relationship with their adoption of selected wheat varieties. Mahmud (2006) found that the cosmopolitanism of the farmers had significant positive correlation with their adoption of modern wheat cultivation technologies.

Aurangozeb (2002) conducted a study on adoption of integrated homestead farming technologies by the rural women in RDRS. He found that there was a significant relationship between cosmopolitanism and adoption of integrated homestead farming technologies. Hussen (2001) found a positive significant relationship between cosmopolitanism of the farmers and their adoption of pesticides.

However, it was hypothesized that researcher found positive relationship on farmers' cosmopolitanism and adoption. It is hypothesized that there may be a non-significant relationship between cosmopolitanism and adoption, which requires further research.

2.3.8 Extension Contact and Adoption

Rabby (2014) found that extension contact of the farmers had positive significant relationship with farmers' attitude towards jute cultivation. Islam (2007) found that extension contact of the farmers had negative significant relationship with attitude of farmers towards modern jute cultivation practices in Baliakandi upazilla under Rajbari district. Rahman (2015), Afroz (2013)

and Islam (2007) found that the farmers extension media contact had positive significant relationship with adaption in their studies. Hossain (2006) concluded that the extension contact of the farmers had positive significant relationship with their adoption of selected HYV rice. Hossain (2003) concluded that communication exposure of the farmers had a significant and positive relationship with their adoption of modern Boro rice cultivation. Haque (2003) concluded that extension contact of the farmers had a significant positive relationship with their adoption of modern maize cultivation technologies.

From the above research, it was hypothesized that researcher found positive relationship between extension contact and adoption. The findings may be vice-versa. So, requires further research.

2.3.9 Knowledge and adoption

Rabby (2014) found that jute cultivation knowledge of the farmers had positive significant relationship with farmers' attitude towards jute cultivation. Islam (2007) found that jute cultivation knowledge of the farmers had significant relationship with attitude of farmers towards modern jute cultivation practices in baliakandiupazilla under Rajbari district. Afroz (2013) and Islam (2007) found that the farmers' knowledge had positive significant relationship with adaption in their studies. Ahmed (2006) found that the knowledge on wheat cultivation of the farmers had significant positive relationship with their adoption of selected wheat varieties. Mahmud (2006) found that the knowledge on wheat cultivation of the farmers had significant positive correlation with their adoption of modern wheat cultivation technologies. Sarder (2002) in his study revealed that agricultural knowledge of the farmers had positively significant with their adoption of IPM practices. Reddy *et al.* (1987) found significant association between knowledge and use of improved package of practices in paddy production by participant and non-participant farmers.

However, researchers could not come to unified decision on farmers knowledge and adoption of modern jute cultivation practices, which requires further research.

2.3.10 Attitude and adoption

Afroz (2013) found that the attitude of the farmers had positive significant relationship with their adoption of wheat cultivation. Ahmed (2006) found that the attitude toward wheat cultivation of the farmers had significant positive relationship with their adoption of selected wheat varieties. Islam (2002) revealed that the attitude towards technology of the farmers had a significant positive relationship with their adoption of modern agricultural technologies. Podder (2000) conducted a study on the adoption of Mehersagar Banana by the farmers of Gazaria union under Sakhipur Thana of Tangail district. He found that there was no relationship between attitude towards technology of the growers and their adoption of modern agricultural technologies. Hasan (1996) conducted a study on adoption of some selected agricultural technologies among the farmers as perceived by the frontline GO and NGO workers. He found that there was strong positive relationship between attitude towards development and perceived adoption of selected technologies.

From the above research it is hypothesized that, there is positive relationship between attitude and adoption. The findings may be vice-versa, which requires more research.

2.4 The Conceptual Framework of the Study

In logical research, determination and estimation of variables comprise a significant undertaking. Appropriately developed theory of any examination contains in any event two variables in particular, "dependent variable" and "independent variable". Choice and estimation of those variables is a significant undertaking. A dependent variable is what shows up, vanishes or fluctuates as the scientist presents, expel or changes the independent variables (Townsend, 1953). An independent variable is that factor which is controlled by the analyst in his endeavor to find out its relationship to a watched wonder.

This study concerned with dependent variable (Improved seed, Line sowing method and Ribbon retting method) adoption of modern jute cultivation practices and the selected characteristics as independent variables, i.e. age, education, farm size, annual family income, income from jute, organizational participation, cosmopolitanism, extension media contact, Knowledge on modern jute cultivation practices, attitude towards modern jute cultivation practices. Based on these above discussion and the review of literature, the conceptual framework of this study has been formulated and shown in figure 2.

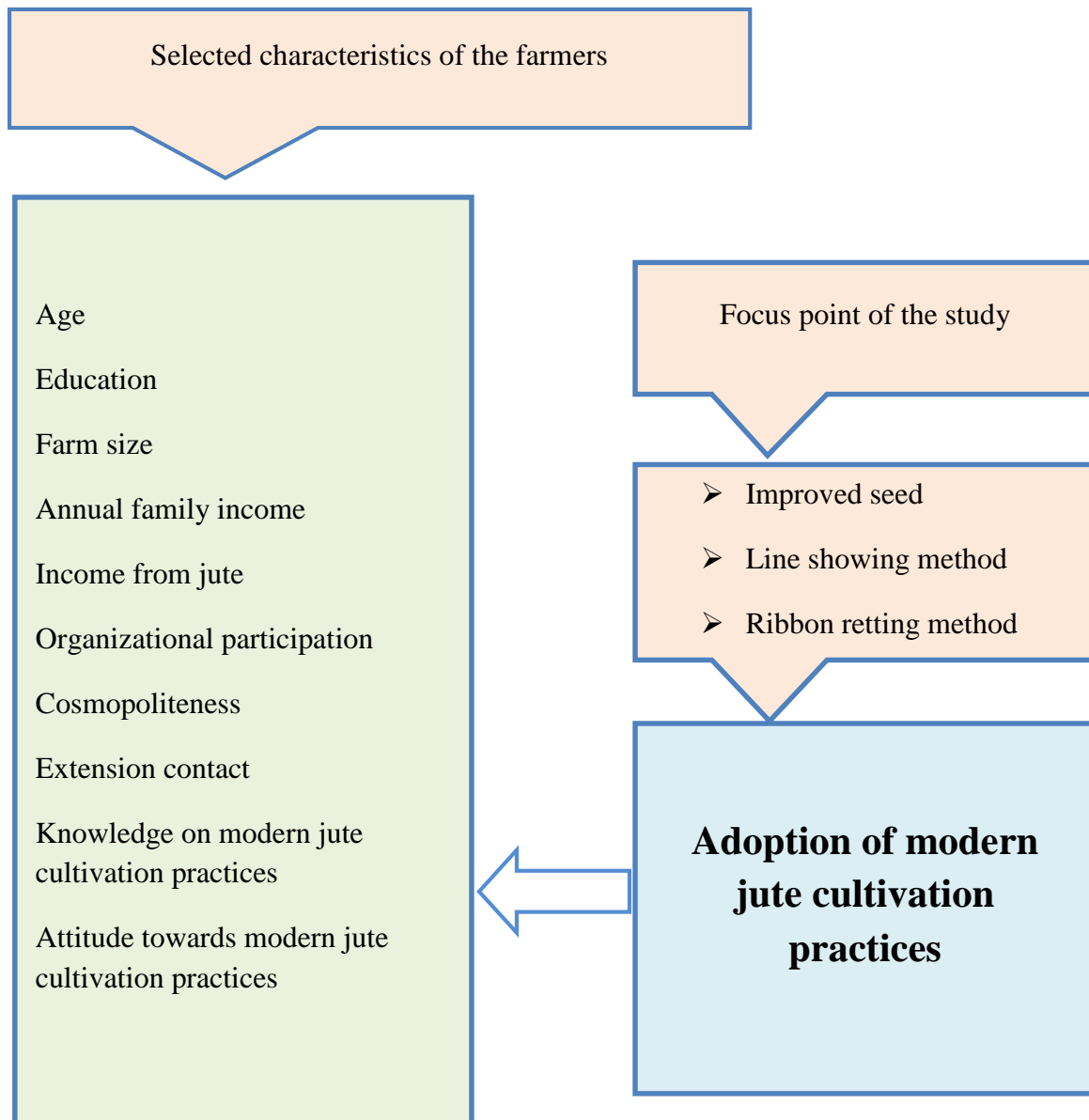


Figure 2.1 The Conceptual Framework of the Study

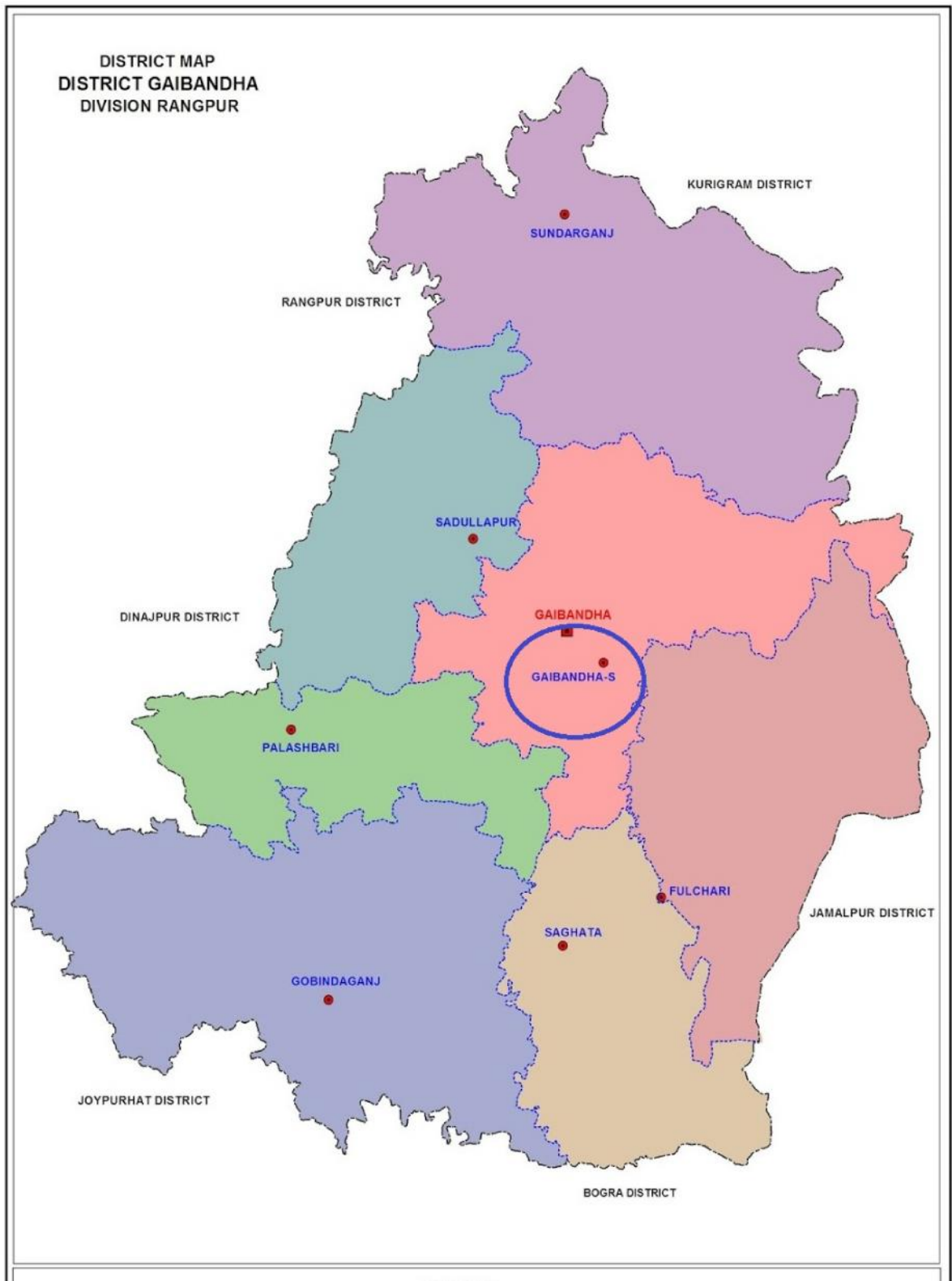
CHAPTER III

METHEDODOLOGY

In a scientific research methods play a vital role. 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 methodology is a structured set of guidelines or activities to generate valid and reliable research results. This Chapter of the thesis illustrates the research methodology and procedures used to collect and analyze the data for answering the research questions and attaining the purposes. A chronological description of the methodology followed in conducting this research work has been presented in the subsequent sections and subsections:

3.1 Locale of the Study

The research was led at Sahapara and Bollamjhar union under Gaibandhasadarupazilla of Gaibandha district which are selected purposively. Out of 28 villages of Sahapara and Bollamjhar union, five were purposively selected. This was because jute is grown more in this area than other area. The selected villages were Nandina, Daulutpur, Mirpur, Sonaidanga and Modhupur. Maps of Bangladesh appearing Gaibandha district and Gaibandha district appearing Gaibandhasadar upazilla appearing the study area are presented in Fig.3.1, 3.2 respectively.



Figure#3.2A map of Gaibandha district showing Gaibandhasadarupazila.

3.2 Population and Sampling Design

The jute farmers under selected five villages were considered as the population of the study. A list of jute farmers who are currently cultivating jute was prepared with the help of upazilla Agriculture office and local SAAO. The number of jute farmers of the selected five villages was 229 which constituted the population of the study. About forty five (45) percent of the population was selected proportionally from the selected villages as the sample by following random sampling method. Thus, the total sample size stood at 103. Moreover, a reserved list of 10 jute farmers was prepared for use when the jute farmers under sample were not available during data collection. The distribution of the selected jute farmers with reserve (10%) list of the selected villages is shown in the table 3.1.

Table 3.1 Distribution of the sampled farmers in the study area

| Name of village | Total no. of jute farmers | Sample | Reserve list (10%) |
|------------------------|----------------------------------|---------------|---------------------------|
| Nandina | 66 | 30 | 3 |
| Daulutpur | 48 | 22 | 2 |
| Mirpur | 21 | 9 | 1 |
| Sonaidanga | 53 | 24 | 2 |
| Modhupur | 41 | 18 | 2 |
| Total | 229 | 103 | 10 |

3.3 Instrument for Data Collection

In a social research, interview schedule is the instrument for data collection. For social research study, preparation of interview schedule for collection of information requires a very careful consideration. So, a structured interview schedule was prepared for collection of relevant data for the study. Both closed and open form questions were included in the schedule. Simple and direct questions were also included to ascertain the opinion of the farmers regarding a number of aspects. The draft interview schedule was prepared in accordance with the objectives of the study. The interview schedule was pre-tested with 10 farmers from the study area excluded from the sample. Necessary corrections, additions and modification were made in the interview schedule based on the pretest results. The modified and corrected interview schedule was then printed in final form and multiplied as required. An English version of this interview schedule is presented in Appendix-A.

3.4 Selection of Dependent and Independent Variables

The successful selection of variables results in success of a research. Inappropriate and inconsistent selection of variables may lead to faulty results. The researcher employed adequate care in selecting the variables of the study. Considering personal, economic, social and psychological factors of the rural community, time and resources availability to research, reviewing relevant literature and discussing with relevant expert, the researcher selected the variables for the study. Farmers' adaptation of modern jute cultivation practices (Improved seed, Line sowing method, Ribbon retting method) was the main focus of this study and it was considered as the predicted variables. The researcher selected ten (10) causal variables. Characteristics of the farmers like age, education, farm size, annual family income, income from jute, organizational participation, cosmopolitanism, extension contact, knowledge on modern jute cultivation practices and attitude towards modern jute cultivation practices were selected as the causal variables.

3.5 Data Collecting Procedure

For the purpose of data collection, a semi-structured interview schedule was used. It was prepared keeping the objectives of the study in mind. The interview schedule contained both open and closed form questions. Direct and simple questions and statements were included in the schedule to collect data on the selected dependent and independent variables.

Data were collected through personal interviewing by the researcher himself through face to face interview. The study was purposively conducted in the Gaibandha district of Bangladesh. Before starting collection of data, the researchers met with the local SAAO of the respective blocks in order to explain the objectives of the study and requested them to provide necessary help and co-operation in collection of data. The local leaders of the area were also approached to render essential help. As a result, there was no problem to collect data. The researcher made all possible efforts to establish rapport with the respondents so that they could feel comfortable to the questions which contained in the schedule. All possible efforts were made to explain the purpose of the study to the respondents and their answers were recorded sincerely. Collection of data took 20 days from 16 January to 04 February 2019.

3.6 Measurement of independent variable

The different characteristics of the jute farmers might have impact on their adaption of modern jute cultivation practices. These characteristics were age, education, farm size, annual family income, income from jute, organizational participation, cosmopolitaness, extension contact, knowledge on modern jute cultivation practices and attitude towards modern jute cultivation practices. The adaption of modern jute cultivation practices was the main center of the study. Measurement of all the factors of the jute farmers and their adaption of modern jute cultivation practices are discussed in the following sub sections:

3.6.1 Age

Age of a respondent was measured in terms of years from birth to the time of interview which was found on the basis of response (Adnan, 2016). A score of one (1) was assigned for each year of age. Question regarding this variable appears in item no. 1 in the interview schedule (Appendix-A).

3.6.2 Education

The education of jute farmers was measured by the number of years of schooling completed in an educational institution. A score of one (1) was given for each year of schooling completed. If jute farmers did not know how to read and write, his education score was zero (0), while a score of 0.5 was given to jute farmers who could sign his name only. If a jute farmer did not go to school but studied at home or adult learning center, his knowledge status was considered as the equivalent to a formal school student (Adnan, 2016).

3.6.3 Farm size

The farm size of a farmer referred to the total area of land on which his/her family carried out farming operations, the area being in terms of full benefit to his/her family (DAE, 1999). Data obtained from asking direct question. The farm size was measured in hectares for each farmer using the following formula:

$$\text{Farm size} = A1 + A2 + 1/2 (A3+A4) + A5$$

Where,

A1 = Homestead area

A2= Own land under own cultivation

A3= Land given to others on borga system

A4= Land taken from others on borga system

A5= Land taken from others on lease

3.6.4 Annual family income

Annual family income of jute farmers was measured in Thousand Taka. The total yearly earning from agricultural (field crops, vegetables, fruits, spices, livestock and fisheries etc) and nonagricultural sources (service, business, and others) by the respondent himself/herself and other members of his family was determined. Thus, yearly earning from agricultural and non-agricultural sources were added together to obtain annual family income of a jute farmers. A score of one was given for each Tk. 1,000 to compute the annual income scores of the respondents.

3.6.5 Income from jute cultivation

Annual income from jute cultivation of a farmer was measured in Thousand Taka. It refers to the earning of the respondent from selling of jute fibre and by products. A score of one was given for each Tk. 1,000 to compute the annual income scores of the respondents.

3.6.6 Organizational participation

Organizational participation of a respondent was measured by the nature of his involvement and duration of participation in Farmer's co-operatives, School committee, Religious committee, Bazar committee, Agricultural club, Local NGO, Village club, Union parishad, Upazila parishad and others. The score of a respondent was computed as follows:

Score according to nature of involvement

No participation = 0

Ordinary member = 1

Executive member = 2

Executive officer = 3

The score according to nature of involvement for each organization was multiplied by the duration (years) of his participation in the respective organization. Finally total scores of all organizations were added together to obtain his total score of organizational participation.

3.6.7 Cosmopolitaness

Cosmopolitaness of a respondent referred to frequency of visit to different places outside from her own village. The following scale was used for computing cosmopolitaness score of a respondent. Each respondent was asked to indicate the extent of his Cosmopolitaness. With five (5) alternative responses as “Regularly”, “Frequently”, “Occasionally”, “Rarely”, “Not at all” basis and weights were assigned as 4, 3, 2, 1 and 0 respectively. Scores obtained for visit to each of the above six categories of places were added together to get the cosmopolitaness score of a respondent. The range of cosmopolitaness score could be from ‘0’ to ‘24’, where ‘0’ indicates ‘no cosmopolitaness’ and ‘24’ indicates ‘very high cosmopolitaness’.

3.6.8 Extension contact

This variable was measured by computing an extension contact score on the basis of a jute farmer extent of contact with 10 selected media as obtained in response to item no.8 of the interview schedule (Appendix A). Each respondent was asked to indicate the extent of his contact with each of the selected media. With five (5) alternative responses as „regularly“, “Frequently”, “occasionally”, “rarely” and “not at all ” basis and weights were assigned as 4, 3, 2, 1 and 0 respectively. The extension contact score of a respondent was determined by summing up his/her scores for contact with all the selected media. Thus possible extension contact score can vary from zero (0) to 40, where zero (0) indicated no extension contact and 40 indicated the highest level of extension contact.

3.6.9 Knowledge on modern jute cultivation practices

After through consultation with relevant experts and reviewing of related literature, 18 questions regarding modern jute cultivation practices were selected and those were asked to the respondents to determine their knowledge on modern jute cultivation practices. Two (2) score was assigned for each correct answer and zero (0) for wrong or no answer. Partial score was assigned for partially correct answer. Thus the knowledge on modern jute cultivation

practices score of the respondent could range from 0 to 36, where zero (0) indicating very poor knowledge and 36 indicate the very high knowledge on modern jute cultivation practices.

3.6.10 Attitude towards modern jute cultivation practices

An attitude may be defined as predisposition to act towards an object in a certain manner. Attitude of a farmer towards modern jute cultivation practices was used to refer to his belief, feelings and action towards the various aspects modern jute cultivation practices. It was measured by constituting 10 statements (five positive and five negative). A statement was considered positive if it possessed an idea favorable towards the modern jute cultivation practices. On the other hand, a statement was considered negative if it was unfavorable towards modern jute cultivation practices. The respondents were asked to express their opinion in the form of “strongly agree” or “agree” or “undecided” or “disagree” or “strongly disagree”. A score of 5 was given to “strongly agreed”, 4 to “agreed”, 3 to “undecided”, 2 to “disagreed” and 1 to “strongly disagreed”, if the statement was positive. A reverse scoring method was followed in case of statements considered negative. Attitude score of a respondent was determined by summing the scores obtained by him for all the items in the scale. The index scores of respondents could range from 10 to 50 where “10” indicating highest unfavorable and “50” for highest favorable attitude towards modern jute cultivation practices.

3.7 Measurement of dependent variable

3.7.1 Adoption of modern jute cultivation practices

Adoption of modern jute cultivation practices was the dependent variable of this study. The practices are Use of improve seed, line showing method, ribbon retting method. It was measured on the basis of the extent of adoption of modern jute cultivation practices by the farmer for a period of 2 years (2017 to 2018). According to Kashem (2004) the adoption quotient is the ratio scale designed to quantify the adoption behavior of an individual. The method of adoption quotient is more accurate as it involves all the related concepts like potentiality, extent of time consistency and weightage. However, the overall modern jute

cultivation practices adoption quotient in this study was computed by using the following formula:

$$AQ = \frac{U}{P} \times 100$$

Where,

AQ = Adoption Quotient

U = Used area

P = Potential area (Source: Kashem-2004.)

Adaptor Golum Mostufa who cultivated jute variety BJC-5003 on his land and he used modern jute cultivation practices (Use of improved seed, Line showing method and Ribbon ratting method).

The calculation of Adoption Quotient (AQ) for above three practices is shown below:

1. For use of improved seed

Used area (U) = 3 ha

Potential area (P) = 3.5 ha

$$AQ = \frac{U}{P} \times 100$$

$$AQ = \frac{3}{3.5} \times 100$$

$$= 85.71\%$$

2. For line showing method

Used area (U) = 2 ha

Potential area (P) = 3.5 ha

$$AQ = \frac{U}{P} \times 100$$

$$AQ = \frac{2}{3.5} \times 100$$
$$= 57.14\%$$

3. For ribbon retting method

Used area(U) = 1.5 ha

Potential area (P) = 3.5 ha

$$AQ = \frac{U}{P} \times 100$$

$$AQ = \frac{1.5}{3.5} \times 100$$
$$= 42.85\%$$

From above calculation, the AQ for use of improved seed, line showing method and ribbon retting method are 85.71%, 57.14% and 42.85% respectively.

So, average AQ is $= \frac{85.71+57.14+42.85}{3}$

= 61.90%

The possible range of adoption from 0 to 100 indicated in percentage. Where 0 indicated no adoption and 100 indicated high adoption.

3.8 Categorization of Data

For describing the independent and the dependent variables, the respondents were classified into several categories in respect of each of the variable. These categories were developed by

considering the nature of distribution of the data and the general conditions prevailing in the social system.

3.9 Statement of Hypothesis

As defined by Goode and Hatt (1952), “A hypothesis is a proposition, which can be put to a test to determine its validity.” It may prove correct or incorrect of a proposition. In any event, however, it leads to an empirical test. Hypothesis are always in declarative sentence form and they relate either generally of specifically variables to sentence form and they relate either generally or specifically variables to variables. Hypothesis may be broadly divided into two categories, namely, research hypothesis and null hypothesis.

3.9.1 Research hypothesis

Research hypothesis states a possible relationship between the variables being studied or a difference between experimental treatments that the researcher expects to emerge. The following research hypothesis was put forward to know the relationships between each of the 10 selected characteristics of the jute farmers and their adaption of modern jute cultivation practices. “Each of the 10 selected characteristics of the jute farmers will have significant relationship with their adaption of modern jute cultivation practices.”

3.9.2 Null hypothesis

A null hypothesis states that there is no relationship between the concerned variables. The following null hypothesis was undertaken for the present study “There is no relationship between the selected characteristics of modern jute farmers and their adaption of modern jute cultivation practices.” “The selected characteristics were age, education, farm size, annual family income, income from jute, organizational participation, cosmopolitaness, extension contact, knowledge onmodern jute cultivation practices, attitude towards modern jute cultivation practices”

3.10 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 in to a Microsoft Excel

Sheet to facilitate tabulation, categorization and organization. In case of qualitative data, appropriate scoring technique was followed to convert the data into quantitative form.

3.11 Statistical Procedures

The data were analyzed in accordance with the objectives of the study. 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. Initially, Pearson's Product Moment Coefficient of Correlation (r) was used in order to explore the relationships between the concerned variables. One percent (0.01) level of probability and five percent (0.05) level of probability were the basis for rejecting any null hypothesis throughout the study. The SPSS computer package was used to perform all these proc

CHAPTER IV

RESULTS & DISCUSSION

In this Chapter, the findings are presented in three sections in accordance with the objectives of the study.

- The first section deals with the selected characteristics of the farmers.
- The second section has dealt with their adoption of modern jute cultivation practices.
- The last section has dealt with relationships between the selected characteristics of the farmers and their adoption of modern jute cultivation practices.

4.1 Selected characteristics of the farmers

Man possesses various interrelated and constitutional characteristics and those form his/her personality. It is expressed behavior or the sum totality of individual characteristics and ways of behaving which determines his unique adjustment to his environment. It includes the individual behavior, appearance, beliefs, attitude, values, motives, emotional reactivity, expressing capacity, experience and individual modes of adjustment. It was therefore, assumed that adaption of modern jute cultivation practices would be influenced by various characteristics of the farmers. Ten characteristics of the respondents were selected to find out their relationship with adaption of modern jute cultivation practices. This has been discussed in the final section of this chapter. The selected characteristics included age, education, farm size, annual family income, income from jute, organizational participation, cosmopolitaness, extension contact, knowledge on modern jute cultivation practices, attitude towards modern jute cultivation practices. The salient features of the ten (10) characteristics of the farmers are presented in Table 4.1.

Table 4.1 Salient features of the selected characteristics of the farmers (N=103)

| Sl. no | Characteristics | Unit of measurement | Possible range | Observed range | Mean | SD |
|--------|--|---------------------|----------------|----------------|--------|-------|
| 1 | Age | Year | unknown | 26-63 | 40.72 | 10.52 |
| 2 | Level of education | Level of schooling | unknown | 00-16 | 5.29 | 4.13 |
| 3 | Farm size | Hectare | unknown | 0.16-4.00 | .84 | .90 |
| 4 | Annual income | “000” Taka | unknown | 85-270 | 186.58 | 50.32 |
| 5 | Income from jute | “000” Taka | unknown | 24-130 | 57.31 | 29.20 |
| 6 | Organizational participation | Score’s | 0-30 | 12-28 | 19.88 | 3.74 |
| 7 | Cosmopoliteness | Score’s | 0-24 | 10-24 | 18.08 | 3.91 |
| 8 | Extension contact | Score’s | 0-40 | 11-38 | 23.89 | 6.34 |
| 9 | Knowledge on modern jute cultivation practices | Score’s | 0-36 | 13-34 | 23.46 | 5.23 |
| 10 | Attitude towards modern jute cultivation practices | Score’s | 0-60 | 18-45 | 27.30 | 5.55 |

4.1.1 Age

Age of the respondents ranged from 26 to 63 years, the average being 40.72 years and the standard deviation was 10.52. On the basis of age, the farmers were classified into three categories: “young aged” (up to 35), “middle aged” (36-50) and “old aged” (above 50 years). Table 4.2 contains the distribution of the respondents according to their age.

Table 4.2 Distribution of the jute farmers according to their age

| Categories | Basis of categorization (year) | Observed range | Respondents | | Mean | SD |
|--------------|--------------------------------|----------------|-------------|------------|-------|-------|
| | | | Numbers | Percent | | |
| Young | Up to 35 | 26-63 | 37 | 35.9 | 40.72 | 10.52 |
| Middle | 36-50 | | 47 | 45.6 | | |
| Old | Above 50 | | 19 | 18.4 | | |
| Total | | | 103 | 100 | | |

Data presented in Table 4.2 indicated that the highest proportion (45.6 percent) of the respondents found in the middle aged category compared to 35.9 percent young and 18.4 percent old aged category. According to Lionberger (1960) elderly farmers seem to be somewhat less motivated to adopt new farm practices than younger ones. Generally, young and middle aged people show more interest to adopt new practices.

4.1.2 Level of Education

The education score of the jute farmers ranged from 0-16, with an average of 5.29 and standard deviation 4.13. Based on their education scores, jute farmers were classified into five categories namely illiterate (0), can sign only (0.5), primary education (1-5), secondary education (6-10) and above secondary (above 10). The distribution of the jute farmers according to their education is shown in Table 4.3.

Table.4.3 Distribution of the jute farmers according to their education

| Categories | Basis of categorization (year) | Observed range | Respondents | | Mean | SD |
|-----------------|--------------------------------|----------------|-------------|---------|------|------|
| | | | Numbers | Percent | | |
| Illiterate | 0 | 00-16 | 17 | 16.5 | 5.29 | 4.13 |
| Can sign only | 0.5 | | 9 | 8.7 | | |
| Primary level | 1-5 | | 26 | 25.2 | | |
| Secondary level | 6-10 | | 41 | 39.8 | | |

| | | | | | | |
|-------------------------------|----------|--|------------|------------|--|--|
| Higher Secondary level | Above 10 | | 10 | 9.7 | | |
| Total | | | 103 | 100 | | |

Data presented in table 4.3 indicated the most of the farmers (39.8%) belong to the Secondary level category, 16.5% of the farmers had no education, 8.7% of them can sign only, 25.2% of them belong to the Primary level and only 9.7% of the farmers had higher secondary qualification. Education increases the power of observation, analysis, integration, understanding, decision making and adjustment to new situation of an individual. Educated farmers may get useful information through reading leaflets, booklets, books and other printed materials. Moreover they possess desire for new and newer information related to their farming operations. Education broadens the power of understanding and develops the abilities of analyzing facts and situation in order to take correct decisions.

4.1.3 Farm size

Farm size varied from 0.16 to 4.00 hectares with an average of 0.84 hectares and standard deviation of 0.90. Based on their farm size the farmers were classified into three categories as suggested by DAE (1999) which shown in Table 4.4.

Table 4.4 Distribution of the farmers according to their farm size

| Categories | Basis of categorization (Hectare) | Observed range | Respondents | | Mean | SD |
|---------------|-----------------------------------|----------------|-------------|------------|------|------|
| | | | Numbers | Percent | | |
| Small | 0.2 - <1 | 0.16-4.00 | 80 | 77.7 | 0.84 | 0.90 |
| Medium | 1 - <3 | | 18 | 17.5 | | |
| Large | Above 3 | | 5 | 4.9 | | |
| Total | | | 103 | 100 | | |

The data in the Table 4.4 revealed that majority of the respondents (77.7percent) had Small farm while 17.5 percent had medium farm and 4.9 percent had large farm. Table 4.4 also shows that overwhelming majority (95.2%) of the total respondent had small to medium size of farm. Hossain *et al.* (2011) also found similar findings in his study. The average farm size

of the farmers of the study area (.592 hectares) was less than that of national average (0.60 hectare) of Bangladesh (BBS, 2014).

4.1.4 Annual family income

Annual family income of the jute farmers ranged from Taka 85-270 thousand, the mean being 186.58 thousand and standard deviation of 50.32. On the basis of their annual income scores, the jute farmers were divided three categories- “low income” “medium income” and “high income”. The distribution of the jute farmers according to their annual family income is shown in Table 4.5.

Table 4.5 Distribution of the farmers according to their Annual family income

| Categories | Basis of categorization (“000” Taka) | Observed range | Respondents | | Mean | SD |
|---------------|--------------------------------------|----------------|-------------|------------|--------|-------|
| | | | Numbers | Percent | | |
| Low income | 85-180 | 85-270 | 50 | 48.5 | 186.58 | 50.32 |
| Medium income | 181-240 | | 33 | 32.0 | | |
| High income | Above 240 | | 20 | 19.4 | | |
| Total | | | 103 | 100 | | |

Data presented in table 4.5 indicated the majority (48.5 percent) of the jute farmers had low income and 32.0 percent of jute farmer had medium income and 19.4 percent high income. It means that overwhelming majority (80.5 percent) of the jute farmers had low to medium annual family income. Farm size is very much related with the income. As farm sizes of the farmers in the study area are small, so naturally the income is low.

4.1.5 Income from jute cultivation

Income from jute cultivation of the jute farmers ranged from Taka 24-130 thousand, the mean being 57.31 thousand and standard deviation 29.20. On the basis of their annual income scores, the jute farmers were divided three categories-“low income” “medium income” and “high income”. The distribution of the jute farmers according to their income from jute cultivation is shown in Table 4.6.

Table 4.6 Distribution of the farmers according to their income from jute cultivation

| Categories | Basis of categorization (“000” Taka) | Observed range | Respondents | | Mean | SD |
|---------------|--------------------------------------|----------------|-------------|------------|-------|-------|
| | | | Numbers | Percent | | |
| Low income | 24-40 | 24-130 | 44 | 42.7 | 57.31 | 29.20 |
| Medium income | 41-100 | | 46 | 44.7 | | |
| High income | Above 100 | | 13 | 12.6 | | |
| Total | | | 103 | 100 | | |

Data presented in table 4.6 , the majority (44.7 percent) of the jute farmers had medium income compared to 42.7 percent low income and 12.6 percent high income from jute cultivation. Thus, the overwhelming majority (87.4 percent) of the farmers had low to medium annual income from jute cultivation. Jute is a cash crop. Due to high production, suitable market price and low cost of production, their income from jute was medium in that study area.

4.1.6 Organizational participation

Organizational participation observed scores ranged from 12 to 28 with the mean of 19.88 and standard deviation of 3.74. The respondents were classified into three categories which are shown in Table 4.7.

Table 4.7 Distribution of the farmers according to their organization Participation

| Categories | Basis of categorization (score’s) | Observed range | Respondents | | Mean | SD |
|------------|-----------------------------------|----------------|-------------|---------|------|----|
| | | | Numbers | Percent | | |
| Low | 12-18 | | 39 | 37.9 | | |
| Medium | 19-22 | | 42 | 40.8 | | |

| | | | | | | |
|--------------|----------|-------|------------|------------|-------|------|
| High | Above 22 | 12-28 | 22 | 21.4 | 19.88 | 3.74 |
| Total | | | 103 | 100 | | |

Data furnished in Table 4.7 indicate that the highest proportion (40.8%) of the respondents felt in the “medium” category and 21.4% felt in “high” category. And 37.9% felt in low category. The more organizational participation activities the more create attitude to adopt modern jute cultivation practices. The farmers with more organizational participation scores are expected in introducing modern practices in jute cultivation.

4.1.7 Cosmopolitaness

The observed cosmopolitaness scores of the jute farmers ranged from 10 to 24 with an average of 18.08 and a standard deviation of 3.91 against the possible range of 0 to 24. On the basis of their cosmopolitaness scores, the jute farmers were classified into three categories: “low cosmopolitaness”, “medium cosmopolitaness” and “high cosmopolitaness”. The distribution of the jute farmer according to their cosmopolitaness is shown in Table 4.8.

Table 4.8 Distribution of jute farmers according to cosmopolitaness

| Categories | Basis of categorization (score's) | Observed range | Respondents | | Mean | SD |
|---------------|-----------------------------------|----------------|-------------|------------|-------|------|
| | | | Numbers | Percent | | |
| Low | Below 16 | 10-24 | 32 | 31.1 | 18.08 | 3.91 |
| Medium | 17-22 | | 62 | 60.2 | | |
| High | Above 22 | | 9 | 8.7 | | |
| Total | | | 103 | 100 | | |

The finding (table 4.8) showed that the majority (60.2 percent) of the jute farmers had medium cosmopolitaness compared to 31.1 and 8.7 percent having low and high cosmopolitaness respectively. Cosmopolitaness influences much in increasing knowledge and forming favorable attitude to adopt modern jute cultivation practices. From the table it could be said that farmers of the study area were more or less cosmopolite than the locality.

4.1.8 Extension contact

The observed extension contact scores of the jute farmers ranged from 11 to 38 against the possible range from 0 to 40, the mean and standard deviation were 23.89 and 6.34 respectively. According to this score, the jute farmers were classified into three categories:

Table 4.9 Distribution of the farmers according to their Extension contact

| Categories | Basis of categorization (score's) | Observed range | Respondents | | Mean | SD |
|--------------|-----------------------------------|----------------|-------------|------------|-------|------|
| | | | Numbers | Percent | | |
| Low | 11-23 | 11-38 | 48 | 46.6 | 23.46 | 6.34 |
| Medium | 24-30 | | 41 | 39.8 | | |
| High | Above 30 | | 14 | 13.6 | | |
| Total | | | 103 | 100 | | |

A proportion of 46.6 percent of the jute farmers had low extension contact compared to 39.8 percent of them having medium extension contact and 13.6 percent of the jute farmers had high contact. Thus, overwhelming majority (86.4 percent) of the jute farmers had low to medium extension contact. It might be the farmers in the study area had low contact due to inappropriate communication. Proper policy implications, training facilities should be increased by both GO and NGO in the study area.

4.1.9 Knowledge on modern jute cultivation practices

Jute farmers' knowledge scores could theoretically range from 0 to 36. But their observed knowledge scores ranged from 13 to 34, the mean being 23.46 and standard deviation 5.23. Based on the theoretical scores, the farmers were classified into three categories as: "low knowledge", "medium knowledge" and "high knowledge". The distribution of the farmers according to their knowledge level is shown in Table 4.11.

Table 4.10 Distribution of the jute farmers according to their knowledge on modern jute cultivation practices

| Categories | Basis of categorization (score's) | Observed range | Respondents | | Mean | SD |
|------------|-----------------------------------|----------------|-------------|---------|------|----|
| | | | Numbers | Percent | | |
| Low | 13-22 | | 37 | 35.9 | | |
| Medium | 23-28 | | 56 | 54.4 | | |

| | | | | | | |
|--------------|----------|-------|------------|------------|-------|------|
| High | Above 28 | 13-34 | 10 | 9.7 | 23.46 | 5.23 |
| Total | | | 103 | 100 | | |

Majority (54.4%) of the farmers possessed medium knowledge and 35.9% and 9.7% of the farmers possessed low and high knowledge on modern jute cultivation practices respectively. Knowledge on anything increases one's awareness, mental alertness and makes one familiar or acquaint with facts, objects, concepts, or practices. Knowledge is quite likely to be inter-linked with education. As the majority farmers belong to secondary level education, the knowledge level of the farmers of the study area was satisfactory. To perform optimum production, farmers should have adequate knowledge on different aspects of modern jute cultivation practices.

4.1.10 Attitude towards modern jute cultivation practices

Farmers' attitude towards modern jute cultivation practices score ranged from 18 to 45 against the possible range of 1 to 50. The average was 27.30 with a standard deviation of 5.55. Based on the observed attitude scores, the farmers were classified into three categories as shown in Table 4.12

Table 4.11 Distribution of the farmers' according to their attitude towards modern jute cultivation practices

| Categories | Basis of categorization (score's) | Observed range | Respondents | | Mean | SD |
|-----------------------------|-----------------------------------|----------------|-------------|------------|-------|------|
| | | | Numbers | Percent | | |
| Unfavorable attitude | below 25 | 18-45 | 39 | 37.9 | 27.30 | 5.55 |
| Neutral attitude | exactly 25 | | 14 | 13.6 | | |
| Favorable attitude | Above 25 | | 50 | 48.5 | | |
| Total | | | 103 | 100 | | |

Data contained in Table 4.12 indicated that majority (48.5percent) of the respondent had favorable attitude towards modern jute cultivation practices as compared to 37.9 percent had unfavorable attitude and 13.6 percent had neutral attitude towards modern jute cultivation practices. Most likely, it may be the cause for the presence of more number of middle aged

and educated farmers. Frequent cosmopolitanism and knowledge help the farmers to form favorable attitude towards modern jute cultivation practices. To develop modern jute cultivation practices, a favorable attitude of the farmers is necessary.

4.1.11 Adoption of modern jute cultivation practices

Adoption of modern jute cultivation practices score was found to range from 24.69 to 91.43. The average score was 57.88 with a standard deviation of 15.73. Based on the scores of adoption of modern jute cultivation practices, the farmers were classified into three categories as ‘low adoption’, ‘medium adoption’ and ‘high adoption’. The distribution of the respondents according to their adoption of modern jute cultivation practices has been presented in Table 4.12.

Table 4.12 Distribution of the farmers according to their adoption of modern jute cultivation practices

| Adoption Categories | Basis of categorization (score's) | Observed range | Respondents | | Mean | SD |
|---------------------|-----------------------------------|----------------|-------------|------------|-------|-------|
| | | | Numbers | Percent | | |
| Low | 24-41 | 24.69-91.43 | 20 | 19.4 | 57.88 | 15.73 |
| Medium | 42-71 | | 67 | 65.0 | | |
| High | Above 71 | | 16 | 15.5 | | |
| Total | | | 103 | 100 | | |

Findings shown in table 4.12 revealed that the highest proportion (65.0 percent) of the respondents had medium adoption of modern jute cultivation practices, while 19.4 percent had low adoption and the rest 15.5 percent had high adoption of modern jute cultivation practices. So, it is revealed that among the farmers of the study area the adoption scenario is moderate. Most of the cultivation area has been captured by rice to meet the demand of food for the ever increasing people. Farmers always want to ensure their food security first then the return from their cultivation. But with the time passing the cost of production of rice is increasing which lead the famers of the study area switch to adopt jute cultivation.

4.2 Relationship between the selected characteristics of the respondents and their adaption of modern jute cultivation practices

The purpose of this section is to explore the relationships of the selected characteristics of the jute farmers with their knowledge on modern jute cultivation practices. Pearson’s Product Moment co-efficient of correlation (r) was used to test a null hypothesis concerning the relation between any two variables. Five percent (0.05) and one percent (0.01) level of probability was used as the basis for rejection of a null hypothesis. Results of correlation have been shown in Table 4.13. Correlation co-efficient among all the variables might be seen in the correlation matrix in Appendix-B.

Table 4.13 Pearson’s product moment co-efficient of correlation showing relationships between adoption of modern jute cultivation practice and the selected characteristics of the farmers

| Dependent Variable | Independent Variables | Value of Co-efficient Correlation | Table Value Significant at 101df | |
|---|--|-----------------------------------|----------------------------------|-------------|
| | | | 0.05% level | 0.01% level |
| Adaption of modern jute cultivation practices | Age | -0.164 ^{NS} | 0.194 | 0.253 |
| | Education | 0.246* | | |
| | Farm Size | 0.086 | | |
| | Annual Income | -0.042 ^{NS} | | |
| | Income from Jute | 0.412** | | |
| | Organizational Participation | 0.446** | | |
| | Cosmopoliteness | 0.189 | | |
| | Extension Contact | 0.249* | | |
| | Knowledge on modern jute cultivation practices | 0.475** | | |
| | Attitude towards modern jute cultivation practices | 0.381** | | |

* Significant at 0.05 level

** Significant at 0.01 level

4.2.1 Relationship between adoption of modern jute cultivation practices and their age

Computed value of the co-efficient of correlation between age of the farmers and their adaption of modern jute cultivation practices was found to be -0.164 (table 4.13). The

following observations were recorded regarding the relationship between the two variables under consideration:

- The computed value of “r” (-0.164) was found smaller than that of the tabulated value (0.194) with 101df at 0.05 level of probability.
- The relationship between the concerned variables was insignificant.
- The null hypothesis was accepted.

The findings indicated that the age of the jute farmers was insignificant. So, there is no relationship of age of the farmers with their adaption of modern jute cultivation practices. Roy (2006) found that age of the farmer had no significant relationship with their knowledge on boro rice cultivation. Similar result was observed by Rahman(2017), Anu (2016), Monalesa (2014), Khan (2005), Islam (2005) and Rahman (2004) in their respective studies.

4.2.2 Relationship between adoption of modern jute cultivation practices and their education

Computed value of the co-efficient of correlation between education level of the farmers and their adaption of modern jute cultivation practices was found to be 0.246*(table 4.13). The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.246*) was found larger than that of the tabulated value (0.194) with 101df at 0.05 level of probability.
- The relationship between the concerned variables was positively significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that education of the jute farmers was positively significant. So, there is a positive relationship of education of the farmers with their adaption of modern jute cultivation practices. Education helps the jute farmers to gain knowledge on the improved methods of cultivation by reading books, leaflets, bulletins and other printed materials. Thus, farming community in the study area may be motivated to modern jute cultivation practices in huge area of land. Similar result was observed by Rahman (2015) and Monalesa (2014) in their respective studies.

4.2.3 Relationship between adoption of modern jute cultivation practices and their farm size

Computed value of the co-efficient of correlation between farm size of the farmers and their adaption of modern jute cultivation practices was found to be .086 (table 4.13). The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (.086) was found smaller than that of the tabulated value (0.194) with 101df at 0.05 level of probability.
- The relationship between the concerned variables was insignificant.
- The null hypothesis was accepted.

Based on the above findings, it can be concluded that farm size of the jute farmers was non-significant. This indicates that farm size of the respondent in this study area was not so important factor to adopt modern jute cultivation practices.

4.2.4 Relationship between adoption of modern jute cultivation practices and their annual income

Computed value of the co-efficient of correlation between annual income of the farmers and their adaption of modern jute cultivation practices was found to be -0.042(table 4.13). The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (-0.042) was found smaller than that of the tabulated value (0.194) with 101df at 0.05 level of probability.
- The relationship between the concerned variables was negatively insignificant.
- The null hypothesis was accepted.

Based on the above findings, it can be concluded that annual income of the jute farmers was insignificant. Income may be generate from different source not perticularly jute cultivation. Similar result was observed by Chowdhury (2014) in his study.

4.2.5 Relationship between adoption of modern jute cultivation practices and their income from jute

Computed value of the co-efficient of correlation between income from jute of the farmers and their adaption of modern jute cultivation practices was found to be 0.412**(table 4.13). The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.412**) was found larger than that of the tabulated value (0.253) with 101df at 0.01 level of probability.
- The relationship between the concerned variables was positively significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that income from jute of the jute farmers was significant. Farmers adopt a new practices based on its effectiveness. May be farmers income from jute in the study area increase due to modern cultivation practices and good market price.

4.2.6 Relationship between adoption of modern jute cultivation practices and their organizational participation

Computed value of the co-efficient of correlation between organizational participation of the farmers and their adaption of modern jute cultivation practices was found to be 0.446**(table 4.13). The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.466**) was found larger than that of the tabulated value (0.253) with 101df at 0.01 level of probability.
- The relationship between the concerned variables was positively significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that organizational participation of the jute farmers was positively significant. They receive detail information about a modern practices from different sources as well as different organization. More organizational participation means more adoption. So, the organizational participation significantly contributed to the adoption of adaption of modern jute cultivation practices.

4.2.7 Relationship between adoption of modern jute cultivation practices and their cosmopolitaness

Computed value of the co-efficient of correlation between cosmopolitaness of the farmers and their adaption of modern jute cultivation practices was found to be .189(table 4.13). The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (.189) was found smaller than that of the tabulated value (0.194) with 101df at 0.05 level of probability.
- The relationship between the concerned variables was insignificant.
- The null hypothesis was accepted.

Based on the above findings, it can be concluded that cosmopolitaness of the jute farmers was nonsignificant. Cosmopolitaness may not influence the farmers adoption of modern jute cultivation practices. So, the Cosmopolitaness non significantly contributed to the adoption of modern jute cultivation practices.

4.2.8 Relationship between adoption of modern jute cultivation practices and their extension contact

Computed value of the co-efficient of correlation between extension contact of the farmers and their adaption of modern jute cultivation practices was found to be 0.249*(table 4.13). The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.249*) was found larger than that of the tabulated value (0.194) with 101df at 0.05 level of probability.
- The relationship between the concerned variables was positively significant.
- The null hypothesis was rejected.

Based on the above findings, it can be concluded that extension contact of the jute farmers was positively significant. The respondents with higher contact with extension media possess higher adoption on modern jute cultivation practices. Different communication media may help them to understand the effectiveness of modern cultivation practices.

4.2.9 Relationship between adoption of modern jute cultivation practices and their knowledge on modern jute cultivation practices

Computed value of the co-efficient of correlation between knowledge of the farmers and their adaption of modern jute cultivation practices was found to be 0.475**(table 4.13). The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.475**) was found larger than that of the tabulated value (0.253) with 101df at 0.01 level of probability.
- The relationship between the concerned variables was positively significant.
- The null hypothesis was rejected.

Based on the above findings, it was concluded that knowledge about modern jute cultivation practices had highly significant positive relationships with the adoption of modern jute cultivation practices. So, it could be said that higher is the knowledge about modern jute cultivation practices, higher is the adoption of modern jute cultivation practices. Knowledge helps the farmers to take the right decision. It guides the farmers to take action for that which is best or profitable for them. Similar result was found by Afroz(2013).

4.2.10 Relationship between adoption of modern jute cultivation practices and their attitude towards modern jute cultivation practices

Computed value of the co-efficient of correlation between attitude of the farmers and their adaption of modern jute cultivation practices was found to be 0.381**(table 4.13). The following observation was recorded on the basis of correlation coefficient:

- The computed value of “r” (0.381**) was found larger than that of the tabulated value (0.253) with 101df at 0.01 level of probability.
- The relationship between the concerned variables was positively significant.
- The null hypothesis was rejected.

Based on the above findings, it was concluded that attitude towards modern jute cultivation practices of the famers had highly significant positive relationships with the adoption of modern jute cultivation practices. A positive attitude is the precondition to adopt an

innovation. It could influence directly to adopt jute cultivation. So, the more attitude towards modern jute cultivation practices, the more adoption of modern jute cultivation practices.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Findings

The major findings of the study are summarized below:

5.1.1 Selected characteristics of the jute farmers

Age: The highest proportion (45.6 percent) of the respondents fell in the middle aged category compared to 35.9 percent young and 18.4 percent old aged category.

Level of education: A large proportion (39.8 percent) of the respondents fell under the category of “secondary education” compared to 16.5 percent “illiterate”, 8.7 percent having “can sign only”, 25.2 percent having “primary education” and 9.7 percent having “higher secondary education”.

Farm size: More than half of the respondent (77.7 percent) had small farm, 17.5 percent had medium farm, and 4.9 percent had large farm. The average farm size of the farmers of the study area was .84 hectares.

Annual family income: The majority (48.5 percent) of the jute farmers had low income compared to 32.0 percent medium income and 19.4 percent having high income. Its indicating that jute cultivation is usually practiced by the farmers of comparatively lower economic standings.

Income from jute cultivation: The majority (44.7 percent) of the jute farmers had medium income compared to 42.7 percent low income and 12.6 percent high income from jute cultivation. Thus, the overwhelming 87.4 percent of the farmers had low to medium annual income from jute cultivation. So, jute cultivation is very profitable.

Organizational participation: Highest proportion (40.8%) of the respondents felt in the “medium” category and 37.9% felt in “low” category. And 21.4% felt in “high” category. Its indicating that modern jute cultivation practices is usually practiced by the farmers who have comparatively medium organizational participation.

Cosmopoliteness: The majority (60.2 percent) of the jute farmers had medium cosmopoliteness compared to 31.1 and only 8.7 percent having low and high cosmopoliteness respectively. It was observed that the jute farmer with medium cosmopoliteness, they are very interest in modern jute cultivation practices.

Extension media contact: A proportion of 46.6 percent of the jute farmers had low extension contact compared to 39.8 percent of them having medium extension contact. 13.9 percent of the jute farmers had high contact. Thus, overwhelming majority (86.4 percent) of the jute farmers had low to medium extension media contact. Extension contact is a very effective and powerful source of receiving information about various new and modern technologies. Its indicating that modern jute cultivation practices is usually practiced by the farmers who have comparatively medium extension media contact.

Knowledge on modern jute cultivation practices: Majority (54.4 %) of the farmer’s possessed medium knowledge and 35.9% and only 9.7% of the farmers possessed low and high knowledge on modern jute cultivation practices respectively. It means that overwhelming majority (90.3%) of the farmers had medium to high knowledge. But to perform better in modern jute cultivation practices, farmers should have adequate knowledge on different aspects of modern jute cultivation practices.

Attitude towards modern jute cultivation practices: Majority (48.5 percent) of the respondent had favorable attitude towards modern jute cultivation practices as compared to 37.9 percent had unfavorable attitude and 13.6 percent had neutral attitude towards modern jute cultivation practices. So, it indicates almost half of total farmer have favorable attitude towards modern jute cultivation practices.

Adoption of modern jute cultivation practices: The highest proportion 65.0 percent of the respondents had medium adoption of modern jute cultivation practices, while 15.5 percent had high adoption and the rest 19.4 percent had low adoption of modern jute cultivation practices.

5.1.2 Relationship between adoption of modern jute cultivation practices and their selected characteristics

Education, income from jute, organization participation, extension media contact, knowledge about modern jute cultivation practices and attitude towards modern jute cultivation practices had significant positive relationships with the adoption of modern jute cultivation practices. Age, farm size, annual income and cosmopolitanesshad non-significant relationships with the adoption of modern jute cultivation practices.

5.2 Conclusions

Conclusions drawn based on the discoveries of this examination and their sensible translation in the light of the other significant components are outfitted beneath:

1. In the study area farmers have been adopting modern jute cultivation practices in various extents. There were 19.4% low adopters, 65.0% medium adopters and 15.5% high adopters. Therefore, it may be concluded that all the farmers of the study area all were adopters in variety of degrees. There is a possibility to decrease the gap if high quality extension service would be conducted.
2. Education of the farmers had significant positive relationship with their adaption of modern jute cultivation practices. Therefore it may be concluded that the farmers having more education had more favorable to adaption of modern jute cultivation

practices. So, extension workers should keep contact with literate and illiterate equally. Farther, they should attempt to provide training to illiterate.

3. Income from jute of the farmers had significant positive relationship with their adaption of modern jute cultivation practices. It was thus proved that farmers' adaption is dependent with their income from jute. Therefore it may be concluded that the farmers having more income from modern jute cultivation had more favorable for adapted modern jute cultivation practices.
4. Organization participation of the farmers had significant positive relationship with their adaption of modern jute cultivation practices. It was thus proved that farmers' adaption is dependent with their organization participation.
5. A great majority (86.4 percent) of the farmers had low to medium extension media contact, while there had a positive significant relationship between extension media contact and adoption of modern jute cultivation practices. Therefore, it may be concluded that, low extension media contact farmers adopted less jute cultivation and with the increase of extension media contact of the farmers tends to increase their extent of adoption.
6. A great majority (90.3 percent) of the farmers had low to medium knowledge about modern jute cultivation practices, while there had a very strong positive significant relationship between knowledge about modern jute cultivation practices of the farmers and their adoption of modern jute cultivation practices. Therefore, it may be concluded that, farmers had higher knowledge about modern jute cultivation practices were adopted more jute cultivation in the study area.
- 9 A proportion of 48.5 percent of the farmers had high favorable attitude towards various aspects of modern jute cultivation practices. It may be concluded that the cultivation of modern jute will not be possible to improve to a significant extent unless the concerned authorities take proper steps to improve farmer's attitude towards modern jute cultivation practices.

5.3 Recommendations

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

5.3.1 Recommendations for policy implication

1. It may be recommended that agricultural extension agencies especially the DAE and relevant NGOs should critically review their training programmes and make sound provisions so that the farmers understand the benefits of adoption of modern jute cultivation practices. The DAE and other non-governmental organizations should strengthen their extension services to the growers and farmers to motivate them for adopting modern jute cultivation practices. The farmers should be encouraged to adopt modern jute production technologies.
2. Education of the farmers had significant positive relationship with their adoption of modern jute cultivation practices. Therefore, it may be recommended that, adult education should be provided to the farmers so that they could increase their educational level which might be helpful to increase their adoption of modern jute cultivation practices.
3. The concerned authorities should take necessary steps to find out how communication behavior of the farmers can be increased. For this, the Sub Assistant Agriculture Officer (SAAO) should frequently visit the farmers and advise them to adopt modern jute. Other print, electronic and inter-personal information media should be used extensively to create awareness and encourage them for adopting modern jute cultivation practices.

4. Adoption of modern jute cultivation practices had significant positive correlation with the knowledge on modern jute cultivation practices of the farmers. This indicates an urgent need for an effective training programme to increase the knowledge on modern jute cultivation practices for developing favorable attitude of the farmers towards the adoption of modern jute cultivation practices. Hence, it may be recommended that arrangements should be made by the relevant authorities to increase the knowledge on modern jute cultivation practices of the farmers through increased extension contact, training programme and so on.
5. Necessary inputs such as seedling, chemical fertilizers, insecticides, quality seeds to be made available to the respondents at right time and at fair prices and proper prices for jute products marketing support should be ensured.

5.3.2 Recommendations for further study

A small and limited research work cannot provide unique and universal information related to actual impact of improving socio-economic status of the farmers. Further studies should be undertaken on related matters.

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

1. The study was conducted in limited areas of Gaibandha district. Findings of the study need verification by the similar research in other part of the country.
2. Eleven characteristics of the farmers were considered as the experimental variable of the study. Therefore, it is recommended that further studies should be conducted with other variables.
3. Further research is necessary to find out the effective ways and means which would contribute in modern jute cultivation practices.

4. This study was conducted adaption of modern jute cultivation practices. Similar study may be undertaken on the adaption of towards other modern crops of Bangladesh.

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APPENDIX-A
Department of Agricultural Extension and Information System
Sher-e-Bangla Agricultural University
Dhaka-1207
An Interview Schedule for the Study Entitled

“ADOPTION OF MODERN JUTE CULTIVATION PRACTICES BY THE FARMERS OF GAIBANDHA DISTRICT”

Serial no.

Name of the respondent.....

Village:..... Union:..... Upazila:..... District:.....

Please answer the following questions

1. Age

How old are you ?years

2. Level of education

(Please mention your level of education)

- a) Cannot read and write _____
- b) Can sign only _____
- c) I have studied upto class _____
 - I. class five
 - II. class six to ten
 - III. class ten to twelve
 - IV. above class twelve

3. Farm size

(Please mention the area of your land according to use)

4. Annual family income

(Please mention the amount of annual income from the following sources)

a) Agricultural sources

| SL. No. | Crop Name | Amount of income(in TK.) |
|---------|----------------|--------------------------|
| 1 | Jute | |
| 2 | Rice | |
| 3 | Maize | |
| 4 | Potato | |
| 5 | Tobacco | |
| 6 | Pulse crop | |
| 7 | Oil crop | |
| 8 | Spice crop | |
| 9 | Vegetables | |
| 10 | Fruits | |
| 11 | Cow, Goat etc | |
| 12 | Fish resources | |
| 13 | Poultry | |
| Total | | |

| Sl. no. | Types of land use | Area of land |
|--|---|--------------|
| F1 | Homestead land (including pond and orchard) | |
| F2 | Land under own cultivation | |
| F3 | Land given to others | |
| F4 | Land taken from others | |
| F5 | Land taken from others on lease | |
| F6 | Others | |
| Total farm size = $F1+F2+1/2(F3+F4)+F5+F6$ | | |

b) Non-Agricultural sources

| SL. No. | Income resources | Amount of income(in TK.) |
|---------|----------------------|--------------------------|
| 1 | Service | |
| 2 | Business | |
| 3 | Day labor | |
| 4 | Other family members | |
| 5 | Others income source | |
| Total | | |

5. Income from Jute

What is your annual income from Jute during last year?TK

6.Organizational participation

Please mention the nature and duration of your participation.

| Sl. No. | Name of Organizations | Nature of Participation | | | |
|---------|--------------------------------------|-------------------------|---------------------|---------------------|----------------------|
| | | Not involved (0) | Ordinary member (1) | Executive member(2) | Executive officer(3) |
| 1 | Farmers' cooperatives | | | | |
| 2 | School committee | | | | |
| 3 | Religious committee | | | | |
| 4 | Bazar committee | | | | |
| 5 | Agricultural club (IPM, Krishi club) | | | | |
| 6 | Local NGO (BRAC, ASA) | | | | |

| | | | | | |
|-----------|-----------------|--|--|--|--|
| 7 | Village club | | | | |
| 8 | Union parishad | | | | |
| 9 | Upazilaparishad | | | | |
| 10 | Others | | | | |

7. Cosmopolitaness

(Please mention the extent of your visit the following place)

| SL. No. | Places of visit | Extent of Visits | | | | |
|----------|---------------------------------------|----------------------------|-------------------------|-----------------------|--------------------|-------------------|
| | | Regularly (4) | Frequently (3) | Occasionall y (2) | Rarely (1) | Not at all (0) |
| 1 | Visit of market near your own village | 10 or more times/month () | 5-9 times / month () | 2-4 times /month () | Once / month () | Not even once () |
| 2 | Visit of relatives/ friends | 6 or more time /month () | 4-5 times / month () | 2-3 times / month () | Once/m onth () | Not even once () |
| 3 | Visit to upazilasadar | 6 or more time / month () | 4-5 times / month () | 2-3times / month () | Once / month () | Not even once () |
| 4 | Visit to other upazilasadar | 4 or more time / month () | 2-3 times / 2 month () | 1-2 times/ 3month () | Once / 6 month () | Not even once () |

| | | | | | | |
|----------|---|----------------------------|-------------------------|-----------------------|------------------|-------------------|
| 5 | Visit to upazila agricultural officer | 1 or more time / month () | 2-3 times / 4 month () | 1-2 times/ 6 month() | Once/ 6 month() | Not even once() |
| 6 | Visit to upazila/district agricultural fair | 1 or more time / year () | 1-2 times / 3 year () | 2-3 times/ 6 year () | Once / 6 year() | Not even once () |

8.Extension contact

(Please mention the extent of your extension contact)

| SL. No. | Contact with the persons | Extent of contact | | | | |
|----------|--|-------------------|-----------------|------------------|-----------------|----------------|
| | | Regularly (4) | Frequently (3) | Occasionally (2) | Rarely (1) | Not at all (0) |
| 1 | Contact with AEO | >5 times/ Year | 4-5 times/year | 2-3 times/year | 1 times/year | 0 time/ year |
| 2 | Contact with SAAO | >7 times/ Year | 5-7 times/ year | 3-4 times/ year | 1-2 times/ year | 0 time/ year |
| 3 | Contact with seed dealers | >9 times/ Year | 7-9 times/ year | 4-6 times/ year | 1-3 times/ year | 0 time/ year |
| 4 | Participation in agricultural training | >9 times/ Year | 7-9 times/ year | 4-6 times/ year | 1-3 times/ year | 0 time/ year |
| 5 | Contact with NGO | >9 times/ Year | 7-9 times/ year | 4-6 times/ year | 1-3 times/ year | 0 time/ year |

| | | | | | | |
|-----|---|-----------------|-----------------|-----------------|-----------------|-----------------|
| | workers | | | | | |
| 6 | Attend agricultural group meeting | Once in a month | Once/ 2 month | Once/ 3 month | Once/ 4 month | 0 time/ 6 month |
| 7 | Listening krishi radio programs | Daily | Weekly | Fortnightly | Once/ month | 0 time/ 6 month |
| 8. | Watching agril. Related programs on TV | Daily | Weekly | Fortnightly | Once/ month | 0 time/ 6 month |
| 9. | Read agril. Related ,magazine, leaflet, booklet, etc. | >7 times/ Year | 5-7 times/ year | 3-4 times/ year | 1-2 times/ year | 0 time/ year |
| 10. | Conducted result demonstration | >9 times/ Year | 7-9 times/ year | 4-6 times/ year | 1-3 times/ year | 0 time/ year |

9. Modern jute cultivation practices Knowledge

Please answer the following questions

| SL. No. | Questions | Assigned score | Obtained marks |
|---------|---|----------------|----------------|
| 1 | Name of tow modern varieties of Jute that you cultivated | 2 | |
| 2 | Mention seed rate of jute cultivation per bigha | 2 | |
| 3 | Indicate two major insects of Jute | 2 | |
| 4 | What is the proper sowing time jute seed? | 2 | |
| 5 | What type of soil is suitable for jute cultivation? | 2 | |
| 6 | Name two major diseases of jute | 2 | |
| 7 | Mention two harmful weeds of jute | 2 | |
| 8 | Mention at least one insecticide, one fungicide and one herbicide of jute | 2 | |

| | | | |
|--------------|--|-----------|--|
| 9 | What is the rate of farmyard manure per bigha is needed in jute cultivation? | 2 | |
| 10 | Mention fertilizer doses in jute cultivation(Urea, TSP and MP) | 2 | |
| 11 | Mention the intercultural operations in jute cultivation | 2 | |
| 12 | Describe line sowing method, inter cropping system and crop rotation in jute cultivation | 2 | |
| 13 | What are the qualities of good jute fibre? | 2 | |
| 14 | What is the duration of normal rating of jute? | 2 | |
| 15 | Indicate at least one modern jute cultivation practices | 2 | |
| 16 | Mention about ribbon retting system of jute | 2 | |
| 17 | Indicate the maturity symptom of jute | 2 | |
| 18 | Mention the use of jute fibre and stick | 2 | |
| Total | | 36 | |

10. Attitude towards Jute

Indicate the degree of agreement against the following statements

| SL. No. | Statement | Nature of opinion | | | | |
|----------|---|-------------------|-------|-----------|----------|-------------------|
| | | Strongly agree | Agree | Undecided | Disagree | Strongly disagree |
| 1 | Modern variety of jute cultivation is profitable than local variety | | | | | |
| 2 | Jute cultivation is profitable than other crops | | | | | |
| 3 | Jute cultivation requires less amount of chemical fertilizers | | | | | |

| | | | | | | |
|-----------|---|--|--|--|--|--|
| 4 | Most of the pest can be controlled by clean cultivation during pest infestation | | | | | |
| 5 | Line sowing does not provide any extra benefit | | | | | |
| 6 | Fibre quality depends on duration of the retting period | | | | | |
| 7 | Ribbon retting is more beneficial than normal retting of jute | | | | | |
| 8 | Jute cultivation depends on rainy season | | | | | |
| 9 | Jute cultivation is more laborious | | | | | |
| 10 | Adoption of modern jute is slowly | | | | | |

11. Adoption

Please mention your potential area and used area in 2017 and 2018 respectively the following jute cultivation practices-

- i. Use of improve seeds.
- ii. Line sowing method.
- iii. Ribbon retting method.

| Year | Potential area (P) | Used area (U) | U/P | Average U/P |
|-------------|---------------------------|----------------------|------------|--------------------|
| 2017 | | | | |
| 2018 | | | | |

Thanks for your kind co-operation.

Dated.....

Signature of the interviewer

APPENDIX – B

Correlation matrix of the dependent and independent variables (N= 103)

| | A | B | C | D | E | F | G | H | I | J | K |
|---|-------|-------|-------|--------|--------|--------|-------|-------|--------|--------|---|
| A | 1 | | | | | | | | | | |
| B | -.084 | 1 | | | | | | | | | |
| C | -.017 | .068 | 1 | | | | | | | | |
| D | -.107 | -.125 | .126 | 1 | | | | | | | |
| E | -.079 | .223* | .228* | .269** | 1 | | | | | | |
| F | .191 | .152 | .129 | .175 | .442** | 1 | | | | | |
| G | -.046 | -.020 | .055 | -.202* | .060 | .099 | 1 | | | | |
| H | -.081 | .098 | -.069 | .143 | .188 | .077 | -.037 | 1 | | | |
| I | .000 | .058 | .192 | .033 | .405** | .409** | .069 | .231* | 1 | | |
| J | -.030 | -.054 | .077 | -.023 | -.063 | .026 | .000 | .106 | .100 | 1 | |
| K | -.164 | .246* | .086 | -.042 | .422** | .446** | .189 | .249* | .475** | .381** | 1 |

* Significant at 0.05 level

** Significant at 0.01 level

A= Age
B= Education
C= Farm Size
D= Annual Income
E= Income from Jute
F= Organization Participation

G= Cosmopolitaness
H= Extension Contact
I = Knowledge
J= Attitude
K= Adaption