

**STUDY ON FARMERS' OPINION ABOUT JACKFRUIT TREE
CULTIVATION AND ITS IMPORTANCE IN A SELECTED
UPAZILA OF TANGAIL DISTRICT**

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**DEPARTMENT OF AGROFORESTRY AND ENVIRONMENTAL
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DHAKA-1207**

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DEPARTMENT OF AGROFORESTRY AND ENVIRONMENTAL
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CERTIFICATE

This is to certify that the thesis entitled “**STUDY ON FARMERS’ OPINION ABOUT JACKFRUIT TREE CULTIVATION AND ITS IMPORTANCE I N A SELECTED UPAZILA OF TANGAIL 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 AGROFORESTRY AND ENVIRONMENTAL SCIENCE** embodies the result of a piece of bona fide research work carried out by, **MAHBUBA MUKTA, Registration No. 18-09135** 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:December,2020

Dhaka, Bangladesh.

Dr Md. Forhad Hossain
Professor
Supervisor

***Dedicated to
My Beloved Parents***

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ABSTRACT

Jackfruit (*Artocarpus heterophyllus*) is mainly produced in Asia belongs to the family Moraceae. India and Bangladesh are the world's leading producers of jackfruit. It is mainly used as fruit but timber, leaves also important products from this. The study was conducted at Sakhipur upazila in Tangail district during January through August, 2020 to determine the farmers opinion about jackfruit tree cultivation and its importance. The aim of this study is to have an finding about the farmers opinion about jackfruit tree cultivation as perceived by the farmers of Shakistan upazila in a Tangail district. Having also purpose to explore the relationship of the selected characteristics of the farmers with farmers opinion about jackfruit tree cultivation. Eighty jackfruit farmers were selected randomly from three villages of Sakhipur upazila in Tangail district . Data were collected through direct interview of the respondents with the help of a questionnaire. SPSS Computer package program was used to analyze the data. Majority of the respondents (55 %) perceived medium level of opinions about jackfruit tree cultivation, 23.75 % found high level and only 21.25 % respondents confirmed low level of opinions. Findings showing that majority (78.75%) of the farmers observed medium to high level of opinions about jackfruit tree cultivation. Level of education of the respondent farmers was an important factor for opinions about jackfruit tree cultivation because moreeducated respondents have more knowledge to give proper opinion about this. Number of jackfruit trees, annual family income, training of the jackfruit farmers, knowledge on jackfruit tree cultivation experience about jackfruit tree cultivation had significant relationships with the farmers opinion about jackfruit tree cultivation.

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CHAPTER I

INTRODUCTION

Jackfruit (*Artocarpus heterophyllus*) is the largest tree borne fruit in the world. Jackfruit is grown widely throughout Bangladesh except some coastal districts. The highest volume of cultivation takes place in Gazipur, Tangail, Dhaka, Mymensingh, Khagrachari, Rangamati, Moulvibazar, Narsingdi, Dinajpur and Rangpur. Major jackfruit producers are Bangladesh, India, Myanmar, Thailand, Vietnam, China, The Philippines, Indonesia, Malaysia and Sri Lanka. It is a popular and relatively cheaper fruit in South Asia and other warm countries. Its fruit is seldom less than about 25 cm in diameter. Even a relatively thin tree (circa 10cm diameter) can bear large fruit. The fruits can reach to 36kg in weight with a size up to 90cm long and 50cm in diameter. The sweet yellow sheaths around the seeds are about 3-5 mm thick. Jackfruit has acclaimed the status of Bangladeshi national fruit due to its popularity and nutritious values. It is economically important throughout the tropics of Asia. It is grown in the homestead in almost all the rural areas of Bangladesh. Jackfruit ranks top in production among the fruits grown in the country. In terms of taking care of the plant, minimal pruning is required; cutting off dead branches from the interior of the tree is only sometimes needed. In addition, twigs bearing fruit must be twisted or cut down to the trunk to induce growth for the next season. Branches should be pruned every three to four years to maintain productivity. Some trees carry too many mediocre fruits and these are usually removed to allow the others to develop better to maturity. Stingless bees such as *Tetragonula iridipennis* are jackfruit pollinators, and so play an important role in jackfruit cultivation (Acedo, 1992).

It is mainly produced in Asia with India and Bangladesh is the world's leading producers with an average of 1.25 million metric tons of fruit annually. The lifespan of the jackfruit tree is 60 to 70 years and a mature plant produces up to 700 fruits per year. Jackfruit is known to be the heaviest fruit with an average fruit weight 10-30 kg and annual average yield of 5080 tons of fruits per hectare of land. Jackfruit comprising 28-33% pulp and 67% waste from which a lot of value-added products can be processed (Morton *et al.*, 2016).

Jackfruit is known to be a good source of vitamin B6 which is not common in other fruits. In many Asian countries' jackfruit is considered a miracle crop that can be used to save millions of people from hunger due to its nutritional composition, size and the many ways in which it can be prepared. During peak season periods due to lack of alternative use, the fruits which cannot be consumed are fed to animals and therefore nutrient drain. In the study area, processing of jackfruit flakes to value added product is still limited. The proportion of the harvested fruits processed is very small (1%) compared to that which is consumed (80%) or fed to animals (6%). There present a quite problem i.e., transportation problem, road infrastructure problem, absence of cold storage and processing center etc. (Love et al., 2011).

Ripe jackfruit is naturally sweet, with subtle pineapple- or banana-like flavoring. It can be used to make a variety of dishes, including custards, cakes, or mixed with shaved ice as *es teler* in Indonesia or *halo-halo* in the Philippines. For the traditional breakfast dish in southern India, the fruit is used with rice as an ingredient and jackfruit leaves are used as a wrapping for steaming. Jackfruit *dosas* can be prepared by grinding jackfruit flesh along with the batter. Ripe jackfruit arils are sometimes seeded, fried and sold as jackfruit chips. The seeds from ripe fruits are edible, and are said to have a milky, sweet taste often compared to Brazil nuts. They may be boiled, baked, or roasted. When roasted, the flavor of the seeds is comparable to chestnuts. Seeds are used as snacks (either by boiling or fire-roasting) or to make desserts. In Java, the seeds are commonly cooked and seasoned with salt as a snack. They are commonly used in curry in India in the form of a traditional lentil and vegetable mix curry. Young leaves are tender enough to be used as a vegetable. In Bangladesh, the fruit is consumed on its own. The unripe fruit is used in curry, and the seed is often dried and preserved to be later used in curry. In India, two varieties of jackfruit predominate: *muttomvarikka* and *sindoor*. *Muttomvarikka* has a slightly hard inner flesh when ripe, while the inner flesh of the ripe *sindoor* fruit is soft. (Ahmmed, 2010).

A sweet preparation called jackfruit jam is made by seasoning pieces of *muttomvarikka* fruit flesh in jaggery, which can be preserved and used for many months. The fruits are either eaten alone or as a side to rice. The juice is extracted and either drunk straight or as a side. The juice is sometimes condensed and eaten as

candies. The seeds are either boiled or roasted and eaten with salt and hot chilies. They are also used to make spicy side dishes with rice. Jackfruit may be ground and made into a paste, then spread over a mat and allowed to dry in the sun to create a natural chewy candy.

Bangladesh is suitable for jackfruit tree production commercially. But very little information is available on cultivation practices, processing and its problem and profitability. Now, there is a need to study the process as ample scope of a boost up its production, particularly in Tangail a famous jackfruit cultivating area in the country. In view of this situation the present study was attempted to analyze cultivation practices, processing and the cost and returns of jackfruit production in Bangladesh. It was expected that present study would be very effective and informative for national research development and policy formulation. So the objectives of the research work were:

OBJECTIVES:

1. To investigate the farmers opinion about jackfruit tree cultivation in Shakipur upazila of Tangail district.
2. To assess the importance of jackfruit tree cultivation.
3. To determine the relationship between the selected variables and opinion of farmers about jackfruit tree cultivation.

CHAPTER II

REVIEW OF LITERATURE

Review of literature deals with the review of past research works that relates to this study directly or indirectly. The reviews are based on the major objectives of the study. Main purpose of this study was to have an understanding of jackfruit tree cultivation and its economic importance as experienced by farmers at selected upazila of Tangail district and their relationships with the selected individual characteristics. However the review of some related studies on jackfruit tree production have been furnished below under the following sections.

General findings on jackfruit tree cultivation and its economic importance and also relation to other crops

Growing fruits have economic importance for the fruit growers and all types of middlemen involved for their economic purposes. Huge quantity of fruits can be supplied to the market for meeting up large amount of fruit demand of people economically active zone of the country. But fruit marketing system is not so improved in most of the area of Bangladesh. There remain a quite problem like transportation problem, road infrastructure problem, absence of cold storage, problem of processing center and low price problem in local area etc.

Artocarpus heterophyllus which is commonly known as jackfruit is a tropical climacteric fruit, belonging to Moraceae family. It is known to be the biggest edible fruit in the world. It is rich in nutrients including carbohydrates, proteins, vitamins, minerals, and phytochemicals. Both the seeds and the flesh of jackfruit are consumed as cooked and boiled forms and the flesh in fully ripen stage can be taken directly as a fruit. Many countries have produced different food products such as jam, jellies, marmalades, and ice creams using jackfruit juice. Parts of jackfruit trees like fruits, leaves, and barks have been extensively used in traditional medicine due to its anticarcinogenic, antimicrobial, antifungal, anti-inflammatory, wound healing, and hypoglycemic effects. Despite these benefits, unfortunately, the fruit is underutilized

in commercial scale processing in regions where it is grown. The aim of this review is to spreading the knowledge on nutritional and health benefits of jackfruit, in order to promote utilization of jackfruit for commercial scale food production (Abedin, 1991).

The exploration for lesser known and under utilized crops, many of which are potentially important as human and animal foods has been the focus for research survey in recent years. This review is related to draw the attention of researchers and policy makers in Pacific agriculture to introduce the physiochemical and functional properties of jackfruit and also to highlight the future prospects and strategy for jackfruit production and utilization. The most important economic product of jackfruit is the fruit which is used both when mature and immature. The flesh of the jackfruit is starchy and is a source of dietary fiber. The presence of isoflavones, antioxidants, and other nutrients in the fruits indicate that jackfruit has anti-cancer properties. The health benefits of jackfruit have been attributed to its wide range of physicochemical applications. In spite of such a huge potential and usefulness, jackfruit remains an underutilized fruit species and deserves to be given the needed thrust for research and development. The focus of this review is to provide information on the research work undertaken about jackfruit, and to provide basic information for future commercialization as functional food and medicine. (Ahmed, 2002).

Local farmers have been facing many problems due to low prices of jackfruit, which were supposed to get bumper yields in eight upazilas of hilly district of Khagrachhari. Some scenario like a farmer namely Abul Kashem from Taindong village under Matiranga upazilla counted a loss of Tk. 800 after selling 4,000 jackfruit at Tk 25,000 only. He blamed poor transpiration system, lower prices and absence of government control on the market regarding this issue (Majumder, 2011).

IT is a research on postharvest loss assessment and nutritional quality of jackfruit. This is conducted in Mymensingh and Gazipur districts and the laboratory experiments were conducted at the laboratories of the Department of Horticulture, Plant Pathology and Biochemistry, BAU, Mymensingh. This study revealed that the postharvest problem of the jackfruit at the 'growers', 'Bepari', 'wholesalers' and 'retailers' levels were 16.13 percent, 11.40 percent, 9.22 percent and 6.76 percent,

respectively and the total postharvest loss of jackfruit was estimated to be 43.51 percent in the full supply chain. This causes mainly due to improper storage, careless handling and traditional transport system of marketing. (Ahmmed, 2010).

a weak agricultural credit system, unorganized market structure, unfavorable weather, small land holding sizes and inadequate technology development contributes to low productivity of jackfruit in the smallholder sector (IDAF, 2009).

Investment is essential for improved maintenance of road and port infrastructures. Also infrastructure development, modification of policies and management are also needed to improve appropriate and timely shipping of perishable (World Bank , 2005).

Appropriate marketing infrastructure is crucial for efficient marketing of fruits. Suitable transportation and product handling are also important for the trade of agricultural products and important factors in assuring good prices and poverty alleviation (Khandaker et al. , 2009).

In this study reported that high cumulative wastages were found across the supply chain which were Mango : 22 percent, Banana : 30 percent, Guava : 16 percent, Litchi : 25 percent, Pineapple : 20 percent, Jackfruit : 12 percent (India Mitra , 2010).

It is observed in a study that a very low percentage of total produce is consumed as a food amounting 30 percent and greater percentages, amounting to about 70 percent is lost in the form of pre and post-harvest problems. The major problem reported in marketing were the absence of properly organized marketing structures, lack of processing plants and the poor demand in local market for jack products. An integrated approach would improve productivity, quality and income from jack cultivation contributing to poverty alleviation in the rural sector to a considerable extent (Medagoda , 2011).

post-harvest loss of fruits and vegetables each year in the Philippines has been estimated at 29 metric tons of protein which could supply the protein requirement of 1.3 M Filipinos.(Pantastico, 1977).

Post-harvest losses of food grains in the developing world from mishandling, spoilage and pest infestation are put at 25 percent; so one-quarter of what is produced never

reaches the consumer for whom it was grown, the effort and money required to produce it are lost-forever. Fruit, vegetables and some crops are much less hardy and are mostly quickly perishable, and if proper care is not taken in their harvesting, handling and transport, they will soon decay and become unfit for human consumption. Estimation of production losses in developing countries are hard to judge, but some authorities put losses of sweet potatoes, plantain, tomatoes, bananas and citrus fruit sometimes as high as 50 percent, or half. Reduction in this problem, particularly if it can economically be avoided, would be of great significance to growers and consumers alike (FAO, 1989).

Post-harvest losses in tropical fruits have been obtained to average between 15 percent–25 percent of production and do not appear to differ between the main crops of bananas, plantains, citrus, mangoes, pineapple, papaya, and avocado. NAC (1978) studied that post-harvest losses occur up to 50 percent in perishable agricultural commodities in developing countries (Yuen and Teng, 1990).

post-harvest wastage of 13 selected fruits and vegetables in major growing areas annually costs the country about Tk 3,442 crore on retail price, Findings also showed that the post-harvest loss ranges from 23.6 to 43.5 percent of the fruits and vegetables that include jackfruit, pineapple, papaya, mango, litchi, banana, orange, cucumber, cauliflower, tomato, okra, brinjal, and red amaranth. Among the selected fruits, post-harvest problems have been found maximum 44 percent in jackfruit with main diseases syndromes of shoot and fruit borer, stem-bleeding, and diedback that appeared as the serious threat in the leading jackfruit producing areas such as Mymensingh and Gazipur. The loss is attached to the fact that jackfruit is seriously damaged by fruit borer insects and is soft rot since the growers of the surveyed region, Mymensingh and Gazipur, hardly apply any pesticides or fungicides to reduce damages in the field. The second and also important reason for higher loss in jackfruit is the excessive use of ripening chemicals, which accelerate fruit ripening and dramatically shorten shelf life (Hassan et al., 2011).

Amiruzzaman (1990) observed that the magnitude of post-harvest losses of major fruits and vegetables in Bangladesh is 25-50 percent and it is only 5-25 percent in developed countries as reported by Khader, 1992. Post-harvest losses in durable crops ranged between 10-15 percent; loss in semi-perishable crops was 15-30 percent and

that of perishables, 25-40 percent. During the actual season like, about 50 percent fruits mainly pineapple, watermelon, jackfruit, tomato etc. is lost due to inadequate processing facilities in Bangladesh (Hussain, 1993).

It is the official report from the BAS stated that jackfruit production continued to slow down by three percent annually since 2003 and recorded a 13.14 percent drop from the period of January to September 2009. In this Crop Statistics report from the period of 2003-2008, BAS explained that the country produced 884 thousand mt of jackfruit in 2008, 14 percent lower than the 1,024 thousand mt in 2007. Report result is the adverse effects of typhoon Frank, rains during flowering stage, less flower induction, toppling down of trees due to typhoon Cosme, and the attack of anthracnose (Mojica , 2010).

The ripe jackfruit present a plenty amount of fermentable sugar, which may be exploited for the commercial production of vinegar and wine. Amit and Ambarish) reported that the maximum alcohol content in jackwine was 10% (v/v), with a sugar utilization of 14% of total sugar solids. These results show promise for the use of this fruit for commercial wine production. A certain maturity level and ripeness of jackfruit (29 to 30 °Brix) are essential for the production of jackfruit wine (Akhter, 2010). Dehydrated jackfruit is a nutritious snack item when made from ripe jackfruit. Jackfruit is golden-yellow to orange and has a chewy texture with a sweet and sour taste (Diamante, 2009). It is report about the preparation of jackfruit chips. The starch and dry matter content of the raw material determines the yield of the processed product. Flake thickness, bulb length, total sugar solids, and reducing sugars were found to be important for increasing the yield and quality of jackfruit chips (Jagadeesh et al., 2006).

The protein and carbohydrate elements of prepared biscuits decreased with higher replacement of jackfruit seed flour. But moisture, fat, crude fiber and ash content increased with higher replacement of jackfruit seed flour. The sensory parameter presented that up to 20% level incorporation biscuits were not significantly different with 0% jackfruit seed flour .But higher level of jackfruit seed flour biscuit rejected by the panelist as it was dark in color and hard texture (Shariful Islam, 2015).

jackfruit seed flour presenting the highest essential amino acid composition followed by jackfruit seed which is germinated and raw jackfruit seeds. Leucine, the amino

acid was the most abundant amino acid in jackfruit seed flour, while lysine and phenylalanine were the highest compositions found in germinated jackfruit seed flour. The jackfruit seed flour had the highest protein content (24.94%) while germinated jackfruit seed flour had the highest vitamin C content (78.78 mg/100 g). The flour element of three different treatments showed that the starch content was highest in germinated jackfruit seed flour while jackfruit seed flour contains vitamin C and also present significant amount of protein and dietary fiber (Zuwariah, 2018).

Nowadays people are more concerned about their health. In view snack ball was prepared using varied concentrations of jackfruit seed flour and in three different formulations study also quantifies changes in thiobarbituric acid, free fatty acid, total phenolic content and antioxidant activity of snack bar packed in polypropylene and metalized polyester films and stored under room temperature conditions for 28 days of storage study. At the time of storage, at room temperature thiobarbituric acid and free fatty acid content were increased while total phenolic content and antioxidant activity were decreased with increase in temperature and progression of storage period. Maximum retention of phytochemicals was seen in the snack ball packed in polypropylene as compared to metalized polyester films and stored at room temperature conditions study indicates potential application of jackfruit seed flour for preparation of low cost nutritious value added product (Meethal, 2017).

Jackfruit seed was transferred into flour and used as a protein and carbohydrate supplement in diets. Also used as a element in foods in bakery product. The jackfruit seeds were dried and milled into flour. The flour has good binding ability to water. The seed flour was effectively used in some food. In the research work the biscuit with 20% concentration of jackfruit seed flour with different particle size was prepared. The particle size of jackfruit seed flour was taken 0.69mm, 0.73 mm, 0.77 mm and 0.82 mm. The overall acceptability of biscuits and cake with jackfruit seed flour particle size 0.77mm and 0.72mm respectively. (Barge 2019). Jackfruit seeds that had been subjected to a combination of soaking, boiling, and fermentation. Five diets were formulated with the cooked Jackfruit seed meal representing 0, 8, 16, 24, and 32% of the diet .Cooking reduced tannins and oxalates in raw jackfruit seeds by over 80%. Soaking-boiling-fermentation treatment does not presenting a effective method to improve the nutritional value of Jackfruit seeds for broiler chickens

(Ndyomugyenyi 2016).According to Palipane , Rolle and Ramli , the maturity indices of jackfruit are as follows:

- (a)The fruit matures in about 12-16 weeks after flowering.
- (b)Fruit colour changes from green to yellowish.
- (c)After tapping the fruit by finger a dull, hollow sound is produced
- (d)Fruit spine becomes large and wide spaced.
- (e)The last leaf of the peduncle yellows.
- (f)An aromatic odor develops.
- (g)The number of spikes on the upper skin is decreased and spikes become flatter.
- (h)Fruit length and girth are increased in size.

Jackfruit should be harvested by cutting from the stalk using sharp bladed equipment. If the jackfruit is high up in the tree, a sack should be tied around the fruit with a rope, the stalk should be cut, and the fruit should be gently lowered to the ground .Accurate determination of maturity and best harvesting time and method correct harvesting practices allows minimum loss of fruits (Ranasinghe, 2019).

CHAPTER III

MATERIALS AND METHODS

This materials and methods includes: (1) Geographical location the study area 2) Methods of investigation, site selection (3) Variables of the study and development of research instrument, and (4) Data collection, processing and analyses.

3.1 Geographical location and physical environment of the study area

3.2 Geographical location

The study was conducted in the Sakhipur upazila under Tangail district. Sakhipur is located at 24.3167° N 90.1750° E . It has 44314 units of house hold and total area 429.63 km².Sakhipur Upazila is bounded by Ghatail Upazila on the north, Mirzapur Upazila on the south, Bhaluka, Sreepur (Gazipur) and Kaliakair Upazilas on the east, Kalihati and Basail Upazilas on the west. Bangshi and Salda rivers are notable. Sakhipur town consists of four Mouzas. The area of the town is 19.67 km². Sakhipur thana was established in 1976 and was turned into an upazila in 1983. The upazila consists of eight union parishads, 65 mouzas and 123 villages. The villages Chatalbaid, Kalidaspara and Gajaria were selected for the study in respect of jackfruit tree production.

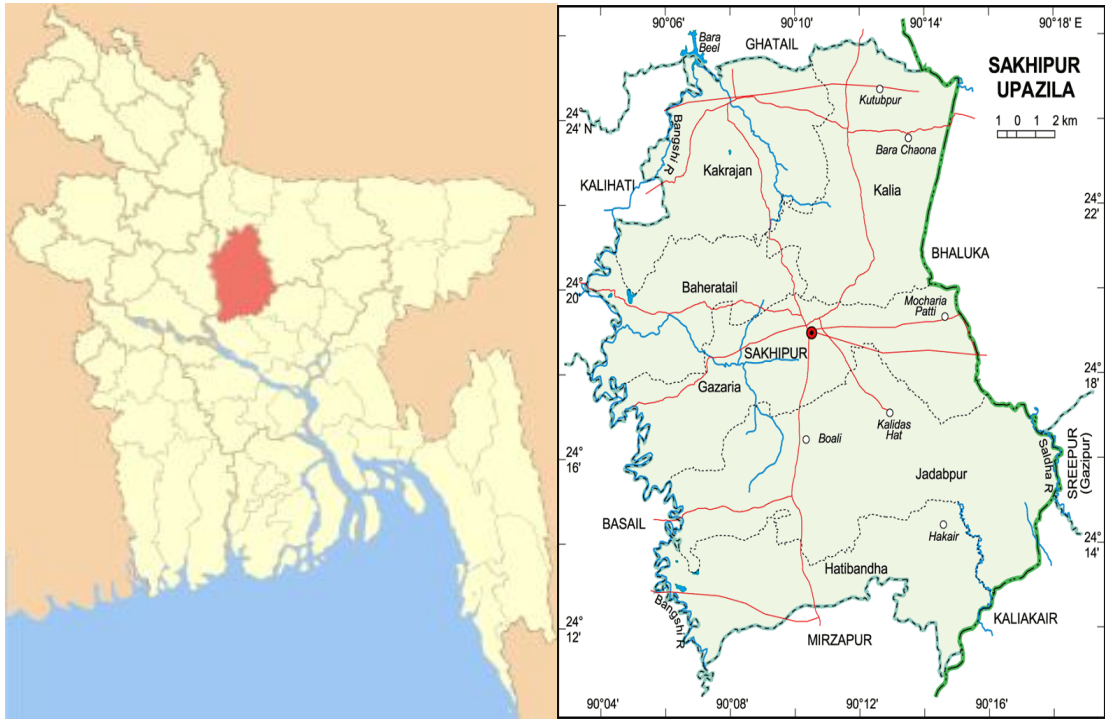


Fig 3.1: Map of Bangladesh Fig 3.2: Map of Sakhipur upazila in a Tangail District

Methods of investigation, site selection and sampling procedure

3.3 Methods of investigation

Farmers of Bangladesh do not usually maintain records and accounts of their farm activity. So, the survey method was followed to achieve the objectives of the study. To minimize errors, several repeated visits were made to collect the data properly. The steps followed in the present study were the selection of the area, specific records of the relevant factors, sampling technique, duration of investigation, preparation of the interview schedule, communication building with respondents, collection of data, processing and analyses of data.

3.4 Site selection

Selection of a study area is the most important work of any socioeconomic research. A socioeconomic survey is to be carried out in a area depends on the particular purpose of the survey and possible co-operation from the farmers (Yang, 1962). A survey was carried out in Sakhipur upazila of Tangail district during January 2020 to August 2020.

3.5 Variables of the study

Variable is the characteristics which can assume varying or different values in successive individual cases (Ezekiel and Fox, 1959). In a socioeconomic research, the selection and measurement of the variables are the important task. Based on related available literature, discussion with teachers, experts and research fellows in the relevant field and considering the time and resources available to the researcher and also respondents variables were selected. The researcher selected 15 characteristics of the jackfruit growers as the variables.

The characteristics includes age, education, land size, number of jackfruit trees, planting materials of jackfruit ,annual family income from jackfruit, Training, experience in jackfruit cultivation, knowledge on jackfruit cultivation, diversified use of jackfruit, price variation on market, demand variation on market, problems faced by the farmers during jackfruit tree cultivation. On the other hand farmers opinions on jackfruit tree cultivation were the main focus of the study.

3.6 Measurement of Variables

In order to conduct the study in accordance with the objectives, it was necessary to measure the variables. The procedure for measuring the variables has been described below

Age

The age of the respondent was expressed in terms of years. It was measured by counting the period of time from his birth to the time of interview on the basis of response of the respondents.

Education

The education level of the respondents of the study area was divided into 3 (three) categories like I do not know how to read and write(0), I do not know how to read and write but can sign only(.5), I studied up to class or....examination(up to class 12).

Family size

The total number of family members of a respondent is family size. The family member included respondent himself, spouse, sons, daughters and other dependents .It

was made by the actual member of family expressed by respondents. If a respondent had eight members in his family, his score was given as 8.

Land size

Land size of the respondents of the study area was divided into five (5) categories like landless (having $\leq .02$ ha land), marginal (.021-.20 ha land), small (.21-1 ha land), medium (1-3 ha land), and large (above 3 ha land).

Number of jackfruit trees

Actual number of jackfruit is the number of jackfruit trees of a jackfruit grower. It was measured by counting the total number of jackfruit trees . A score of one (1) was assigned for each tree. Question regarding this variable appears in item number 5 in the interview schedule as presented in Appendix- A.

Source of planting materials

Planting materials for jackfruit tree cultivation of the study area was divided into two (2) categories. 1) Those are having seed which farmer collected from their own garden 2) another persons for further cultivation, seedling which farmer collected from nearest nursery .

Annual income from jackfruit

Annual income was measured by the total income yearly earned by a respondents family (respondent himself and other family members) from agricultural (crops and homestead etc.) and non-agricultural sources (service, business etc.) but here only jackfruit based annual income is concered. Annual income was expressed in Taka per year.

Training received

Training received by farmers was asked as Yes or No. For measuring the training attended by farmers a score of 1 assigned for Yes, 0 for No (Appendix I).

Experience in jackfruit cultivation

Experience in jackfruit cultivation of a respondent was measured on the basis of his/her time of jackfruit cultivation in terms of years. A score of one (1) was termed

for each year of jackfruit cultivation. It was measured in full years through a respondent. Question regarding this variable appears in item number 9 in the interview schedule as presented in Appendix- A.

Knowledge on Jackfruit cultivation

Knowledge on jackfruit cultivation refers to the ability of a respondent to recall or recognize about jackfruit cultivation. A scale consisting of 14 questions was used to determine the knowledge score of the respondents on jackfruit cultivation. The questions were prepared from different information of Jackfruit production, harvesting and marketing after thorough consultation with the relevant experts and review of relevant literatures as shown in Appendix A. Each respondent was asked 14 questions. A score of two (2) was assigned for each complete and correct answer and 0 (zero) for incorrect or no answer for each question. Thus, the total assigned score 28 of all the questions. The total score obtained by answering all the questions was the knowledge score of the respondents. Thus, the score could range from 0 to 28 where '0' indicating 'very low knowledge' and '28' indicating 'very high 'knowledge' on jackfruit cultivation. Questions regarding this variable appear in item no. 10 of the interview schedule

Use or importance of jackfruit

Six questions was used to determine the use of jackfruits. Each respondent was asked 6 questions. For each question three categories was asked as, Low, Medium, High and assigned score was 1, 2 and 3 respectively. Thus, the score could range from 6 to 18 where '6' indicating 'very low diversified use of jackfruit knowledge and '18' indicating 'very high 'diversified use of jackfruit knowledge' on jackfruit tree cultivation.

Price variation on market

A scale consisting of 3 items of opinion as low, medium and high and assigned score was 1, 2, 3 respectively for both local market and national market. Questions regarding this variable present in item no. 12 of the interview schedule.

Demand variation on market

A scale consisting of 3 items of opinion as low, medium and high and assigned score was 1, 2, 3 respectively for both local market and national market.

Problems faced by the farmers during jackfruit tree cultivation

Problem was measured one such a way that, using the closed form of questions as doing survey. A scale consisting of 9 questions was used to determine the Problems faced by the farmers score range of the respondents during jackfruit cultivation. The questions were prepared from different information of Jackfruit cultivation and management, harvesting and marketing. The relevant literatures as shown in Appendix A. Each respondent was asked 9 questions. For each question 5 categories was asked as, strongly agreed, agreed, no opinion, disagree, strongly disagreed and assigned score was 4, 3 and 2,1,0 respectively. Thus, the score could range from 0 to 36 .

3.7 Jackfruit Cultivation Practice

Cultivation practice of jackfruit tree of the farmers was determined by planting materials used, source of planting materials, time of seedling, fertilizer use, maturity symptom and harvesting time.

Planting time of seedling

Planting should be done when the plants have the greatest chances of survival. The best time is during the rainy season (june to july).

Fertilizer use

Some farmer use fertilizer during cultivation and some are not and who are used to fertilizer they used Ash, Cowdung, Urea etc. Fertilizer used more during plantation period.

Maturity symptom

There are some external signs in the jackfruit. The fruit mature in about 180 to 270 days after flowering. A dull, hollow sound is produced when the fruit is tapped by the finger with yellowish color. When the fruit is mature, it makes a dull hollow noise

when tapped. Green fruit will have a solid sound and mature fruit a hollow sound. Also, the spines of the fruit are well developed and spaced and slightly soft. The fruit will emit an aromatic aroma and the last leaf of the peduncle will yellow when the fruit is mature.

Harvesting time

Although the collection of jackfruit trees for wood purposes is done almost throughout the year, the best time of jackfruit harvesting during may to august.

Marketing system

Efficient marketing is important to reduce postharvest loss, and risk and uncertainty in timely delivery of quality and safe produce at reasonable prices to the consumers. Most of the farmers (40%) sell their product to the middlemen (Bepari) at their farm gate followed by Bepari and local market (31.67%). Only 28.33% of the farmers, who were mostly under marginal and small category, sell their product at local market. Marketing system of Bangladesh is not so developed so actual farmers do not get the right price of jackfruit.

3.8 Data collection, processing and analyses

Independent Variables

Age, Education, Family size, land size, number of jackfruit trees, planting materials of jackfruit ,annual family income from jackfruit, Training, experience in jackfruit cultivation, knowledge on jackfruit cultivation, diversified use of jackfruit, price variation on market, demand variation on market, problems faced by the farmers during jackfruit tree cultivation.

Dependent Variables: farmers opinions on jackfruit tree cultivation

Sampling technique and data collection procedure

This study was conducted in Tangail district .Tangail district is consisting of 12 upazilas.Out of 12,1 upazilas namely Sakhipur was randomly selected. Sakhipur upazilas has many villages. Among them 3 villages namely Chatalbaid, Kalidaspara and Gajaria were randomly selected. There are total 130 jackfruit tree production respondents families in these selected villages. Out of 130 families, a sample of 80

respondents Chatalbaid, Kalidaspara and Gajaria were selected randomly from the selected areas. A suitable questionnaire was used to collect information on jackfruit tree production from the selected respondents. Final selection has been done by the (Yamane, 1967) formula:

$$n = N / \{ 1 + N(e)^2 \}$$

Where,

n = Sampling size

N = Population

e = Error of precision

Table 1. Distribution of population and sample size in three selected villages

Upazila	Villages	No of total respondents	No of selected respondents
Sakhipur	Chatalbaid	55	40
	Kalidaspara	40	25
	Gajaria	35	15
Total	3	130	80

Preparation of the interview schedule

According to the objectives of the study, an interview schedule or questionnaire was prepared for collecting the needed data from the sample farmers. On the basis of the pretest of this schedule, necessary modification, addition and alteration were made to improve the validity and applicability of the schedule. The interview schedule is presented in Appendix I.

Method of data collection

According to the objectives of the study, an interview schedule was prepared. On the basis of the pre-test of this schedule, necessary modification, addition and alteration were made to increase the validity and applicability of the schedule.



Fig 3.3 Data collection with the help of questionnaire.

Secondary data

In the context of this study, secondary data were available in our country. Very few information was collected from the Forest Department, Agricultural University and other sources and mainly collected from internet.

Processing and tabulation of data

Data Processing

The collected data were examined thoroughly to detect errors and omission. As a matter of fact the researcher made a careful scrutiny while completing the interview schedule to make sure that the information were entered as complete as possible and well arranged to facilitate coding and tabulation. After completion of field survey, the entire interview schedule was compiled. Local units were converted into standard unit and qualitative data were converted into quantitative data by means of suitable scoring whenever necessary. The responses of the individual respondent contained in the interview schedule were transferred to a master sheet for entering the data in the computer. As soon as the data entered into the computer, it was then analyzed in accordance with the objectives of the study.

Statistical Analysis

Descriptive statistical methods like number and percentage distribution, range, mean, standard deviation etc. were used in describing the variables of the study. For understanding properly, tables were also included in presenting the data, for expressing the relationships between the dependable and independable variables by the farmers and their selected characteristics; Pearson's Product Moment Coefficient of Correlation (r) was used. The analysis of data was performed by using SPSS computer program. Throughout the study, at least five percent (0.05) level of probability was used as a basis of rejecting any null hypothesis.

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of chapter four is to describe the findings or objectives of the study. Data gained from respondents by interview with questionnaire were measured, analyzed, tabulated and statistically analysed according to the objectives of the study.

4.1 Selected Characteristics of the respondents

- Age
- Education
- Land size
- Family size
- The number of jackfruit trees
- Planting materials of jackfruit
- Income from jackfruit (Annual)
- Training
- Experience or skill in jackfruit cultivation
- Knowledge on Jackfruit cultivation
- Importance or use of jackfruit cultivation.
- Price variation on market
- Demand variation on market
- Problems faced by the farmers
- Farmers opinions about of jackfruit tree cultivation

The noticeable topographies of the 14 characteristics of the jackfruit growers and jackfruit, each of which constituted an independent variable and farmers opinion about jackfruit tree cultivation is the dependent variable.

Table 2. The salient features of the selected characteristics of the respondents

Categories		Measuring Unit	Range		Mean	S D
			Minimum	Maximum		
Age		Years	29	75	47.90	12.94
Education		Year of schooling	0	12	3.52	3.03
Family size		Number	4	12	7.81	2.03
Land size		Hectare	.16	1.72	.515	.29
Number of jackfruit trees		Number	10	49	29.59	11.50
Planting materials		Score	1	2	1.95	.219
Income (annual)		Score	6000	33000	18430	7111.59
Training		Score	0	1	.29	.45
Farmers experience		Score	3	24	11.86	4.17
Farmers knowledge		Score	6	28	16.31	6.89
Importance		Score	8	16	12.03	2.16
Price variation	Local market	Score	1	3	1.26	.52
	National market	Score	1	3	2.29	.53
Demand variation	Local market	Score	1	3	1.33	.56
	National market	Score	1	3	2.19	.480
Problems faced by the farmers		Score	12	31	19.26	4.31
Farmers opinion about jackfruit tree cultivation		Score	7	18	13.39	3.41

4.1.1 Age

The sample respondents of the study area were categorized on the basis of their age viz. 29 to 75 years (Table 4.2). The highest portions of jackfruit tree producers were in the age group of 36-50 years and the corresponding percentage was 56.25 and the lowest in the age group of up to 35 and the corresponding percentage was 18.75, while the rest of the respondents (25%) belong to the age group of above 50 years .In the findings observed that maximum middle aged farmers were involved with jackfruit tree cultivation. However, young aged (up to 35) was also interested to jackfruit tree production gradually.

Table 3. Distribution of the farmers according to their age

Categories	Farmers		Mean	SD
	Number	Percent		
Young aged (up to 35)	15	18.75	47.90	12.94
Middle-aged (36-50)	45	56.25		
Old(>50)	20	25.00		
Total	80	100		

4.1.2 Education

Education of the respondents was measured by the following procedure .The education ranged from 0-12, with an average of 3.52 and standard deviation of 3.03. The respondents were classified into four categories on the basis of their education (Table 4.3). It is observed in the Table 4.3 that 23.75 percent comprised primary level, 20 percent comprised of secondary level, above secondary 6.25 percent, 50 percent of the respondents were illiterate. The findings indicate that education of an individual is likely to be more interested to overcome the problems in their daily life. Thus, farming community in the study area may be well considered as a suitable ground for the adoption of different mechanism, or execution of change program whatever needed.

Table 4. Distribution of the farmers according to their education

Categories	Farmers		Mean	SD
	Number	Percent		
Illiterate (0-0.5)	40	50.00	3.52	3.03
Primary level (1-5)	19	23.75		
Secondary level (6-10)	16	20		
Above secondary level (>10)	5	6.25		
Total	80	100		

4.1.3 Family size

The family size scores of the farmers ranged from 4 to 12 with standard deviation 2.03 (Table 4.4). Most of the farmers (63.75%) had medium family size compared to (22.5%) large and 13.75 percent small family size. In Bangladesh it is very common to live together with parents and with sons and daughter and sometimes with relatives (GOB, 2001).

Table 5. Distribution of the farmers according to their family size

Categories	Farmers		Mean	S D
	Number	Percent		
Small family (up to 5)	11	13.75	7.81	2.03
Medium family (6-9)	51	63.75		
Large family (above 9)	18	22.50		
Total	80	100		

4.1.4 Jackfruit land size

Jackfruit land size varied from .16 to 1.72 hectare with an average of .515 hectare and standard deviation of .29. The respondents were classified into 3 categories on the basis of their farm land size (Table 4.5) following DAE. In the Table 4.5 reveal that more than two-third (87.5 %) of the total respondent had small farm where, 0 respondents were landless, 8.75 percent farmers had medium jackfruit land, 3.75 percent respondents are marginal and 0 respondents had large jackfruit land .In the table 4.5 also shows that majority (96.25 %) of the total respondent had small to medium size of jackfruit land. The marginal farmers has very little scope to undergo higher commercialization of jackfruit. On the other hand the farmer with large jackfruit land size can easily go under higher commercialization with a great scope.

Table 6. Distribution of the farmers according to their land size

Categories	Farmers		Mean	SD
	Number	Percent		
Marginal (up to 0.2 ha)	3	3.75	0.51	0.29
Small (0.21-1.0 ha)	70	87.50		
Medium (1.01-3.0 ha)	7	8.75		
Total	80	100		

4.1.5 Number of jackfruit trees

The observed jackfruit tree number of the farmers ranged from 10 to 49 with a mean of 29.59 and standard deviation of 11.5. The respondents were classified into three categories (Mean \pm Standard Deviation) as shown in Table 4.6. The table 4.6 showing that farmers under low number of jackfruit trees category constitute the lowest proportion (11.6 %) compared to 68.6 percent under highest number category and 19.8 percent under small number category. Thus, overwhelming majority (88.4%) of the farmers had medium to large number of jackfruit trees.

Table 7. Distribution of the farmers according to their number of jackfruit trees

Categories	Farmers		Mean	SD
	Number	Percent		
Low tree (up to 18)	22	27.50	29.59	11.50
Medium tree (19-40)	41	51.50		
High tree (above 40)	17	21.25		
Total	80	100		

4.1.6 Planting materials of jackfruit cultivation

The findings of the study indicated that most of the farmers (95%) used seedling which collected from nursery for jackfruit tree cultivation and only 5% of the farmers used seed (Table 4.7). From this table, it is clear that seedling is the most of farmers choice for better jackfruit tree cultivation . Here mean 1.95 and standard deviation .21(table 4.7)

Table 8. Distribution of the farmers according to their planting material of jackfruit cultivation

Categories (Scores)	Farmers		Mean	SD
	Number	Percent		
Seed (1)	4	5.00	1.95	0.21
Seedling (2)	76	95.00		
Total	80	100		

4.1.7 Annual family income from jackfruit

Income from jackfruit (annual) of the respondents was measured in 'thousand taka' per year and in the present study that ranged from 6000 to 33000 with an average of 18430 and standard deviation of 7111.59. On the basis of annual family income from jackfruit, the respondents were divided into three Data furnished in Table 4.5 reveal that above half (68.6 %) of the respondents had medium annual income from jackfruit while 11.6 percent and 19.8 percent of them had low and high annual income from jackfruit respectively. Major portion of the rural farm families possessed small to medium income and thus maximum income from jackfruit was medium to high. Aziz (2004), Islam (2003) and Nahar (2000) found more or less similar findings in their respective studies.

Table 9. Distribution of the farmers according to their income from jackfruit

Categories	Farmers		Mean	SD
	Number	Percent		
Low income (up to 10000)	11	13.75	18430	7111.59
Medium income (10001-20000)	38	47.50		
High income (above20000)	31	38.75		
Total	80	100		

4.1.8 Training received

In the study area, 28.75% of the respondents have received training on different aspects of jackfruit tree cultivation and 71.25% had no training. The computed training participation scores of the farmers varied from 0-1. It was observed that mean .29 and standard deviation .45 (table 4.9) .

Table 10. Distribution of the farmers according to their training

Categories (Scores)	Farmers		Mean	SD
	Number	Percent		
Yes (1)	23	28.75	0.29	0.45
No (0)	57	71.25		
Total	80	100		

4.1.9 Experience in jackfruit cultivation

It was measured in terms of actual years of jackfruit cultivation and in the present study that ranged from 3 to 24 with an average of 11.86 and standard deviation of 4.17. On the basis of this (experience in jackfruit cultivation), the respondents were divided into three categories (Mean \pm Standard Deviation) as shown in Table 4.10. Table 4.10 shows that respondent farmers under medium experience category constitute the highest proportion (65%) compared to about same (21.25 %) low experience category and only 13.75 percent high experience category. Thus, overwhelming majority (86.25%) of the farmers had low to medium experience in jackfruit cultivation.

Table 11. Distribution of the farmers according to their experience in jackfruit tree cultivation

Categories	Farmers		Mean	SD
	Number	Percent		
Low experience (up to 7)	17	21.25	11.86	4.17
Medium experience (8-15)	52	65.00		
High experience (above 15)	11	13.75		
Total	80	100		

4.1.10 Knowledge on jackfruit cultivation

Knowledge on jackfruit tree cultivation score of the respondents ranged from 6 to 28 against the possible range of 0 – 28 and having an average of 16.31 and standard deviation of 6.89. Here the respondents were classified into three categories (Mean \pm Standard Deviation) namely, ‘low knowledge’, ‘medium knowledge’ and ‘high knowledge’. The distribution of the respondents according to their knowledge level on jackfruit tree cultivation is given in Table 4.10. Table 4.10 shows that above 47.5% of the respondents felt in medium knowledge category(11-22) followed by 23.75 percent in low knowledge category(up to 10) and only 28.75 percent in high knowledge category(above 22). The findings of the present study again reveal that maximum jackfruit growers in the study area had medium knowledge on jackfruit tree cultivation.. Knowledge is to be considered as important thing in any aspect of the situation regarding jackfruit tree cultivation. To perform optimum jackfruit tree cultivation, jackfruit growers should have adequate knowledge on different aspects of it.

Table 12. Distribution of the respondents according to their knowledge on jackfruit tree cultivation

Categories (Scores)	Farmers		Mean	SD
	Number	Percent		
Low (up to 10)	19	23.75	16.31	6.89
Medium (11-22)	38	47.50		
High (above 22)	23	28.75		
Total	80	100		

4.1.11 Importance or use of jackfruit tree cultivation

Use or importance of jackfruit by the respondents was measured in terms of multipurpose use of jackfruit and in the present study that ranged from 8 to 16 and having an average of 12.03 and standard deviation of 2.16. On the basis of use of jackfruit, the respondents were divided into three categories (Mean \pm Standard Deviation) as shown in Table 4.12. Table 4.12 shows that respondents under diversification of jackfruit use category constitute the maximum proportion 58.75%

under medium category, 11.25% under high category and 30 percent under low category. Thus, overwhelming majority (88.75%) of the farmers had low to medium knowledge on diversified use of jackfruit.

Table 13. Distribution of the respondents according to their importance or use of jackfruit tree cultivation

Categories (Scores)	Farmers		Mean	SD
	Number	Percent		
Low (up to 10)	24	30.00	12.03	2.16
Medium (11-14)	47	58.75		
High (above 14)	9	11.25		
Total	80	100		

4.1.12 Jackfruit price variation on market

Selling price of jackfruit at different marketing system (local and national market) given opinion among the respondents was measured by the situation of market condition where jackfruit selling occurred frequently high, medium or low level. Here, Two type of marketing system was considered as local market and national market system. Score range was 1 to 3 for both local and national market with mean values of 1.26(local) and 2.29(national) respectively, standard deviation of .52 and .53 respectively presented in Table 4.13. Selling price variation occurred due to market difference. Table 4.13 shows that selling price is more in national market than local market. Maximum (62) respondents obtained that selling price is low(77.5%) in local market (table 4.13) where only 3.75 percent was in national market(table 4.14). About 18.75 percent respondents showed that selling price is medium in local market where 63.75 percent respondents showed that selling price is medium in national market. But in case of local market, only 3.75 percent respondents showed that selling price is high in local market and 32.5 percent respondents showed that selling price is high in national market. It is true that market price of any product depends on its quality , sufficient supply and market strategy.

**Table 14. Distribution of the farmers according to their price variation
(local market)**

Categories (Scores)	Farmers		Mean	SD
	Number	Percent		
Low (1)	62	77.50	1.26	0.52
Medium (2)	15	18.75		
High (3)	3	3.75		
Total	80	100		

**Table 15. Distribution of the farmers according to their price variation
(national market)**

Categories (Scores)	Farmers		Mean	SD
	Number	Percent		
Low (1)	3	3.75	2.29	0.53
Medium (2)	51	63.75		
High (3)	26	32.50		
Total	80	100		

4.1.13 Jackfruit demand variation on market

It was measured by the market condition where jackfruit selling demand categorized as high, medium or low level. Here, Two level of marketing system was considered as local market and national market. Score range was 1 to 3 for both local and national market, mean values of 1.33 and 2.29 respectively and standard deviation of .56 and .53 respectively (Table 4.15 and 4.16). Selling demand variation occur due to market difference .In the Table 4.15 and table 4.16 showing that selling demand is greater in national market than local market .The selling demand is low in local market 72.5% where only 3.75 percent is in national market . Respondents 22.5% showed that selling demand is medium in local market where 73.75 percent respondents were in medium selling demand in national market. But in case of local market, only 5 percent respondents showed that selling demand is high in local market and 22.5 percent respondents showed that selling demand is high in national market.

**Table 16. Distribution of the farmers according to their demand variation
(local market)**

Categories (Scores)	Farmers		Mean	SD
	Number	Percent		
Low (1)	58	72.50	1.33	0.56
Medium (2)	18	22.50		
High (3)	4	5.00		
Total	80	100		

**Table 17. Distribution of the farmers according to their demand variation
(national market)**

Categories (Scores)	Farmers		Mean	SD
	Number	Percent		
Low (1)	3	3.75	2.19	0.53
Medium (2)	59	73.75		
High (3)	18	22.50		
Total	80	100		

4.1.14 Problems faced by the farmers during jackfruit tree cultivation

Problems faced in jackfruit tree cultivation of the respondents ranged from 12 to 31 against the possible range of 0 – 36, average of 19.26 and standard deviation of 4.31. Based on the observed scores of problem faced in jackfruit commercialization, the respondents were classified into the three categories (Mean \pm Standard Deviation) like low, medium and high problem. More than half (57.5%) of the respondents faced medium problem in jackfruit tree cultivation, while 17.5 percent faced high problems and only 15 percent faced low problems (Table 4.17). Findings again revealed that overwhelming majority of the farmers faced medium problems in jackfruit tree cultivation.

Table 18. Distribution of the respondents according to their Problems faced by the farmers during jackfruit tree cultivation

Categories (Scores)	Farmers		Mean	SD
	Number	Percent		
Low (up to 15)	12	15.00	19.26	4.31
Medium (16-23)	54	57.50		
High (above 23)	14	17.50		
Total	80	100		

4.1.15 Farmers opinions about jackfruit tree cultivation

Respondents opinions about jackfruit tree cultivation ranged from 7 to 18 against the possible range of 0 – 20, average of 13.39 and standard deviation of 3.41. Based on the observed scores, the respondents were classified into three categories (Mean \pm Standard Deviation) like low, medium and high categorized (Table 4.18). Majority of the respondents (55 %) perceived medium level of opinions about jackfruit tree cultivation, 23.75 percent found high level and only 21.25 percent respondents confirmed low level of opinions about jackfruit tree cultivation. Findings revealed that majority (78.75%) of the farmers observed medium to high level of opinions about jackfruit tree cultivation.

Table 19. Distribution of farmers according to their opinion about jackfruit tree cultivation

Categories	Farmers		Mean	SD
	Number	Percent		
Low (up to 10)	17	21.25	13.39	3.41
Medium(11-16)	44	55.00		
High (>16)	19	23.75		
Total	80	100		

Table 20. Co-efficient of correlation showing relationship between dependent and independent variable

Predicted Variable	Experimental variables		Computed value of "r"	Tabulated value of "r"	
				at 0.05 level	at 0.01 level
Farmers opinion about jackfruit tree cultivation	Age		0.201 ^{NS}	0.217	0.283
	Education		0.354 ^{**}		
	Family size		0.189 ^{NS}		
	Farm land size		0.273 [*]		
	No. of jackfruit trees		0.368 ^{**}		
	Planting materials		0.111 ^{NS}		
	Annual family income		0.220 [*]		
	Training		0.285 [*]		
	Farmers experience		0.276 [*]		
	Farmers Knowledge		0.399 ^{**}		
	Importance of jackfruit		0.380 ^{**}		
	Price variation	local market	0.169 ^{NS}		
		national market	0.154 ^{NS}		
	Demand variation	local market	0.175 ^{NS}		
		national market	0.110 ^{NS}		
	Problem faced by the farmers during jackfruit tree cultivation		0.177 ^{NS}		

^{NS} Not significant, * Significant at 0.05 level of probability, ** Significant at 0.01 level of probability

4.2 Relationships between age of the jackfruit growing farmers and farmers

Opinion about jackfruit tree cultivation

This relationship between age of the farmers and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between age of the jackfruit farmers and Farmers opinion about jackfruit tree cultivation”.

The coefficient of correlation between age of the jackfruit farmers and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was found to be .201. Observations were taken on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) This is a positive trend of relationship between the concerned variables.
- b) The observed value of ‘r’ .201 between the concerned variables was found to be smaller than the tabulated value $r = 0.217$ with 78 degrees of freedom at 0.05 level of probability.
- c) The null hypothesis could not be rejected.
- d) It is a non significant relationship between the concerned variables at 0.05 level of probability.

Findings indicated that, age of the jackfruit famers had no significant relationships with Farmers opinion about jackfruit tree cultivation. That means opinion about jackfruit tree cultivation come to mind for all aged farmers. This represent that age of the respondent farmers was not an important factor for opinion about jackfruit tree cultivation

4.2.1 The relationships between education of the jackfruit farmers and farmers opinion about jackfruit tree cultivation

In this case, relationship between education level of the jackfruit farmers and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between level of education of the jackfruit farmers and Farmers opinion about jackfruit tree cultivation”.

The coefficient of correlation between education level of the jackfruit farmers and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was found to be .354. Observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) It is a positive trend of relationship between the concerned variables.
- b) The observed value of ‘r’ .354 between the concerned variables was found to be larger than the tabulated value $r = .283$ with 78 degrees of freedom at 0.01 level of probability.
- c) The null hypothesis could be rejected.
- d) It is a significant relationship between the concerned variables at 0.01 level of probability

This indicated that, level of education of the jackfruit farmers had significant relationships with farmers opinion about jackfruit tree cultivation. This represent that level of education of the respondent farmers was an important factor for dependent variable.

4.2.2 Relationships between family size of the jackfruit growing farmers and farmers opinion about jackfruit tree cultivation

The relationship between family size of the farmers and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between family size of the jackfruit farmers and Farmers opinion about jackfruit tree cultivation”.

The coefficient of correlation between family size of the jackfruit farmers and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was found to be .189. Observations were taken on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) This is a positive trend of relationship between the concerned variables.
- b) The observed value of ‘r’.189 between the concerned variables was found to be smaller than the tabulated value $r = 0.217$ with 78 degrees of freedom at 0.05 level of probability.
- c) The null hypothesis could not be rejected.
- d) It is a non significant relationship between the concerned variables at 0.05 level of probability.

Findings indicated that, family size of the jackfruit famers had no significant relationships with Farmers opinion about jackfruit tree cultivation. This represent that family size of the respondent farmers was not an important factor for opinion about jackfruit tree cultivation.

4.2.3 Relationship between jackfruit land size of the farmers and farmers opinion about jackfruit tree cultivation

This relationship between jackfruit land size of the farmers and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between jackfruit land sizes of the farmers and Farmers opinion about jackfruit tree cultivation”.

The coefficient of correlation between jackfruit land size of the farmers and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was .273. Observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) It is a positive trend of relationship between the concerned variables.
- b) The observed value of ‘r’ .273 between the concerned variables was found to be larger than the tabulated value .217 with 78 degrees of freedom at 0.05 level of probability.
- c) The null hypothesis could be rejected.
- d) It is a significant relationship between the concerned variables at 0.05 level of probability

This indicated that, jackfruit land size of the farmers had significant relationships with the Farmers opinion about jackfruit tree cultivation. This represent that jackfruit land size of the respondent farmers was an important factor for Farmers opinion about jackfruit tree cultivation.

4.2.4 The relationships between number of jackfruit trees and farmers opinion about jackfruit tree cultivation

Relationship between number of jackfruit trees and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between number of jackfruit trees and Farmers opinion about jackfruit tree cultivation”.

The coefficient of correlation between number of jackfruit trees and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was found to be .368. Observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) This is a positive trend of relationship between the concerned variables.
- b) The observed value of 'r' .368 between the concerned variables was found to be larger than the tabulated value $r = .283$ with 78 degrees of freedom at 0.01 level of probability.
- c) The null hypothesis could be rejected.
- d) It is a significant relationship between the concerned variables at 0.01 level of probability

Findings indicated that, number of jackfruit trees had significant relationships with farmers opinion about jackfruit tree cultivation. This represent that number of jackfruit trees of the respondent farmers was an important factor for dependent variable.

4.2.5 Relationships between planting materials of jackfruit cultivation and farmers opinion about jackfruit tree cultivation

In this case, relationship between planting materials of jackfruit cultivation and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between planting materials of jackfruit cultivation and Farmers opinion about jackfruit tree cultivation”.

The coefficient of correlation between planting materials of jackfruit cultivation and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was found to be .111. Observations were taken on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) It is a positive trend of relationship between the concerned variables.
- b) The observed value of 'r'.111 between the concerned variables was found to be smaller than the tabulated value $r = 0.217$ with 78 degrees of freedom at 0.05 level of probability.
- c) The null hypothesis could not be rejected.
- d) It is a non significant relationship between the concerned variables at 0.05 level of probability.

This indicated that, planting materials of jackfruit cultivation had no significant relationships with Farmers opinion about jackfruit tree cultivation. This represent that planting materials of jackfruit cultivation was not an important factor for farmers opinion about jackfruit tree cultivation.

4.2.6 Relationship between income from jackfruit (annual) and farmers opinion about jackfruit tree cultivation

This relationship between income from jackfruit (annual) and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between income from jackfruit (annual) and Farmers opinion about jackfruit tree cultivation ”.

The coefficient of correlation between income from jackfruit (annual) and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was .220. Observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) This is a positive trend of relationship between the concerned variables.
- b) The observed value of 'r' .220 between the concerned variables was found to be larger than the tabulated value .220 with 78 degrees of freedom at 0.05 level of probability.
- c) The null hypothesis could be rejected.

d) It is a significant relationship between the concerned variables at 0.05 level of probability

Findings indicated that, income from jackfruit (annual) had significant relationships with the Farmers opinion about jackfruit tree cultivation. This represent that income from jackfruit (annual) was an important factor for Farmers opinion about jackfruit tree cultivation.

4.2.7 Relationship between training of the farmers and farmers opinion about jackfruit tree cultivation

The relationship between training of the farmers and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between training of the farmers and Farmers opinion about jackfruit tree cultivation ”.

The coefficient of correlation between training of the farmers and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was .285. Observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) It is a positive trend of relationship between the concerned variables.
- b) The observed value of ‘r’ .285 between the concerned variables was found to be larger than the tabulated value .217 with 78 degrees of freedom at 0.05 level of probability.
- c) The null hypothesis could be rejected.
- d) It is a significant relationship between the concerned variables at 0.05 level of probability

This indicated that, training of the farmers had significant relationships with the Farmers opinion about jackfruit tree cultivation. This represent that training of the farmers was an important factor for Farmers opinion about jackfruit tree cultivation.

4.2.8 Relationship between experience in jackfruit cultivation of the farmers and farmers opinion about jackfruit tree cultivation

Here, relationship between experience in jackfruit cultivation of the farmers and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between experience in jackfruit cultivation of the farmers and Farmers opinion about jackfruit tree cultivation ”.

The coefficient of correlation between experience in jackfruit cultivation and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was .276. Observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) It is a positive trend of relationship between the concerned variables.
- b) The observed value of ‘r’ .276 between the concerned variables was found to be larger than the tabulated value .217 with 78 degrees of freedom at 0.05 level of probability.
- c) The null hypothesis could be rejected.
- d) It is a significant relationship between the concerned variables at 0.05 level of probability

Findings indicated that, experience in jackfruit cultivation had significant relationships with the Farmers opinion about jackfruit tree cultivation. This represent that experience in jackfruit cultivation was an important factor for Farmers opinion about jackfruit tree cultivation. with the increase of experience in jackfruit cultivation, Farmers opinion about jackfruit tree cultivation will be modified positively.

4.2.9 Relationship between knowledge on jackfruit cultivation of the farmers and farmers opinion about jackfruit tree cultivation

Here, relationship between knowledge on jackfruit cultivation of the farmers and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between knowledge on jackfruit cultivation of the farmers and Farmers opinion about jackfruit tree cultivation ”.

The coefficient of correlation between knowledge on jackfruit cultivation of the farmers and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was .399. Observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) This is a positive trend of relationship between the concerned variables.
- b) The observed value of ‘r’ .399 between the concerned variables was found to be larger than the tabulated value .283 with 78 degrees of freedom at 0.01 level of probability.
- c) The null hypothesis could be rejected.
- d) It is a significant relationship between the concerned variables at 0.01 level of probability

This indicated that, knowledge on jackfruit cultivation of the farmers had significant relationships with the Farmers opinion about jackfruit tree cultivation. This represent that experience in jackfruit cultivation was an important factor for Farmers opinion about jackfruit tree cultivation. With the increase of knowledge on jackfruit cultivation, Farmers opinion about jackfruit tree cultivation will be modified positively.

4.2.10 Relationship between use or importance of jackfruit and farmers opinion about jackfruit tree cultivation.

The relationship between use or importance of jackfruit and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between use or importance of jackfruit and Farmers opinion about jackfruit tree cultivation ”.

The coefficient of correlation between use or importance of jackfruit and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was .399. Observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) It is a positive trend of relationship between the concerned variables.
- b) The observed value of ‘r’ .399 between the concerned variables was found to be larger than the tabulated value .283 with 78 degrees of freedom at 0.01 level of probability.
- c) The null hypothesis could be rejected.
- d) It is a significant relationship between the concerned variables at 0.01 level of probability

Findings indicated that, use or importance of jackfruit had significant relationships with the Farmers opinion about jackfruit tree cultivation. This represent that use or importance of jackfruit was an important factor for Farmers opinion about jackfruit tree cultivation.

4.2.11 Relationship between jackfruit price variation on market and farmers opinion about jackfruit tree cultivation.

This relationship between jackfruit price variation on market and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between jackfruit price variation on market and Farmers opinion about jackfruit tree cultivation”.

The coefficient of correlation between jackfruit price variation on market and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was found to be .169(local market), .154(national market) respectively. Observations were taken on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) This is a positive trend of relationship between the concerned variables.
- b) The computed value of ‘r’ .169(local market) and .154 (national market) respectively between the concerned variables was found to be smaller than the tabulated value $r = 0.217$ with 78 degrees of freedom at 0.05 level of probability.
- c) The null hypothesis could not be rejected.
- d) It is a non significant relationship between the concerned variables at 0.05 level of probability.

Based on the above findings, it was explained that jackfruit price variation at different marketing system had a non significant positive relationship with the farmers opinion about jackfruit tree cultivation.

4.2.12 Relationship between jackfruit demand variation on market and farmers opinion about jackfruit tree cultivation.

The relationship between jackfruit demand variation on market and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between jackfruit demand variation on market and Farmers opinion about jackfruit tree cultivation”.

The coefficient of correlation between jackfruit demand variation on market and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was found to be .175(local market),.110(national market) respectively. Observations were taken on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) It is a positive trend of relationship between the concerned variables.
- b)The computed value of ‘r’ .175(local market) and.110 (national market) respectively between the concerned variables was found to be smaller than the tabulated value $r = 0.217$ with 78 degrees of freedom at 0.05 level of probability.
- c) The null hypothesis could not be rejected.
- d) It is a non significant relationship between the concerned variables at 0.05 level of probability.

Based on the above findings, it was explained that jackfruit demand variation at different marketing system had a non significant positive relationship with the Farmers opinion about jackfruit tree cultivation.

4.2.13 The relationships between problems faced by the farmers during jackfruit tree cultivation and farmers opinion about jackfruit tree cultivation

In this case, relationship between problems faced by the farmers during jackfruit tree cultivation and Farmers opinion about jackfruit tree cultivation was determined by Pearson product moment correlation coefficient and examined by testing the concerned null hypothesis:

“There is no relationship between problems faced by the farmers during jackfruit tree cultivation and Farmers opinion about jackfruit tree cultivation”.

The coefficient of correlation between problems faced by the farmers during jackfruit tree cultivation and Farmers opinion about jackfruit tree cultivation is presented in Table 4.19. The coefficient of correlation between the concerned variables was found to be .177. Observations were taken on the basis of the value of correlation coefficient between the two concerned variables of the study under following consideration:

- a) This is a positive trend of relationship between the concerned variables.
- b) The observed value of ‘r’ .177 between the concerned variables was found to be smaller than the tabulated value $r = 0.217$ with 78 degrees of freedom at 0.05 level of probability.
- c) The null hypothesis could not be rejected.
- d) It is a non significant relationship between the concerned variables at 0.05 level of probability.

This indicated that, problems faced by the farmers during jackfruit tree cultivation had no significant relationships with Farmers opinion about jackfruit tree cultivation .That means opinion about jackfruit tree cultivation come to mind for all problem in jackfruit tree cultivation. This represent that problems faced by the farmers during jackfruit tree cultivation was not an important factor for opinion about jackfruit tree cultivation.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

The study was conducted at Sakhipur upazila under Tangail district during the month of January to August 2020. The purpose of this study is to have an understanding about the farmers opinion about jackfruit tree cultivation of Shakhipur upazila under Tangail district. The study also have purpose to explore the selected characteristics namely age, education, family size, land size, jackfruit tree number, planting materials of jackfruit, annual income from jackfruit, training, experience in jackfruit cultivation, knowledge on jackfruit cultivation, importance or use of jackfruit, demand variation of jackfruit at different marketing system and price variation of jackfruit at different marketing system problems faced by the farmers during jackfruit tree cultivation.

Age of the respondents ranged from 29 to above 75 years where the highest 56.25% of the farmers was group of 36-50 years age, 25% was in up to 35 year ages. The education level of the farmer in the study showed that most of the respondents were illiterate.

The family size scores of the farmers ranged from 04 to above 12 years with standard Deviation 2.03. The study showed 63.75% of the farmers had medium family size compared to 22.5% large and 13.75 percent small family size. The homestead of the sample farmer ranged from 0.16-1.72 ha with an average of 0.515 ha with standard deviation of .29. The observed jackfruit tree number of the farmers ranged from 10 to 49 with a mean of 29.59 and standard deviation of 11.5.

Above half (68.6 %) of the respondents had medium annual income from jackfruit while 11.6 percent and 19.8 percent of them had low and high annual income from jackfruit respectively. Experience was measured in terms of actual years of jackfruit cultivation and in the present study that ranged from 3 to 24 with an average of 11.86 and standard deviation of 4.17.

Knowledge on jackfruit tree cultivation score of the respondents ranged from 6 to 28 against the possible range of 0 – 28 and having an average of 16.31 and standard deviation of 6.89. Importance of jackfruit by the respondents was measured in terms of multipurpose use of jackfruit and in the present study that ranged from 8 to 16 and having an average of 12.03 and standard deviation of 2.16.

Here, Two type of marketing system was considered as local market and national market system. Score range was 1 to 3 for both local and national market with mean values of 1.26(local) and 2.29(national) respectively, standard deviation of .52 and .53 respectively presented in Table 4.13. Problems faced in jackfruit tree cultivation of the respondents ranged from 12 to 31 against the possible range of 0 – 36 , average of 19.26 and standard deviation of 4.31. Two level of marketing system was considered as local market and national market. Score range was 1 to 3 for both local and national market, mean values of 1.33 and 2.29 respectively and standard deviation of .56 and .53 respectively (Table 4.15 and 4.16).

Majority of the respondents (55 %) perceived medium level of opinions about jackfruit tree cultivation, 23.75 percent found high level and only 21.25 percent respondents confirmed low level of opinions about jackfruit tree cultivation. Findings revealed that majority (78.75%) of the farmers observed medium to high level of opinions about jackfruit tree cultivation. So department of Agricultural Extension (DAE) should take necessary actions to encourage more income generation through providing new technologies to the farmers about jackfruit tree cultivation

According to respondents opinion, these problems were mostly due to irregular fruiting and fall of immature fruit and also in want of proper commercialization and also severe losses was occurred this (Mollaet al., 2011). So it is necessary to take initiative to reduce problems related to jackfruit pre and postharvest operations.

CONCLUSIONS

The main purpose of this study is to have an understanding about the farmers opinion about jackfruit tree cultivation of Shakipur upazila in a Tangail district. The study also have purpose to explore the relationship of the selected characteristics of the farmers with farmers opinion about jackfruit tree cultivation. It is expected that this study will be helpful for the people who will want to know about jackfruit tree cultivation. Around 80 farmers is connected with this study.

1) Majority of the respondents (55 %) perceived medium level of opinions about jackfruit tree cultivation, 23.75 percent found high level and only 21.25 percent respondents confirmed low level of opinions about jackfruit tree cultivation. Findings revealed that majority (78.75%) of the farmers observed medium to high level of opinions about jackfruit tree cultivation.

2) Level of education of the jackfruit famers had significant relationships with farmers opinion about jackfruit tree cultivation. This represent that level of education of the respondent farmers was an important factor for opinions about jackfruit tree cultivation. A more educated respondents have enough knowledge to give proper opinion about jackfruit tree cultivation.

3) So, it can be concluded that with the increase of annual family income from jackfruit Farmers opinion about jackfruit tree cultivation will be positively modified. Training of the jackfruit famers had significant relationships with farmers opinion about jackfruit tree cultivation. Farmers opinion about jackfruit tree cultivation and experience about jackfruit tree cultivation had a significant relationships.

4) Due to, if having more experience about jackfruit tree cultivation ,opinion about jackfruit tree cultivation will be positively modified .Knowledge on jackfruit tree cultivation had significant relationships with the Farmers opinion about jackfruit tree cultivation. Farmers opinion about jackfruit tree cultivation and importance of jackfruit had a significant relationships.

RECOMMENDATIONS

1. The present study was undertaken to explore contribution of 14 selected characteristics of the farmers with their opinion about jackfruit tree cultivation. So further studies should be done considering other characteristics of the farmers.
2. This study was carried out in only one upazilla of Bangladesh under Tangail district. Similar studies should be done in other parts of the country to get a clear result of the whole country.
3. Department of Agricultural Extension (DAE) should take necessary actions to encourage more jackfruit cultivation through providing new technologies to the farmers about jackfruit tree cultivation .

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APPENDIX A

English Version of the Interview Schedule

Department of Agroforestry and Environmental Science
Sher-e-Bangla Agricultural University, Dhaka-1207.

Questionnaire on

“STUDY ON FARMERS’ OPINION ABOUT JACKFRUIT TREE CULTIVATION AND ITS IMPORTANCE IN A SELECTED UPAZILA OF TANGAIL DISTRICT”

(Please answer the following questions and put (√) mark whenever application)

Serial No. :

Name of the respondent :

Please provide information on the following aspects.

1. Age

What is your age?----- Years.

2. Education

What is your education level? Give (√) to appropriate place/ fill in the blanks.

- a) I don't know how to read and write ()
- b) I don't know how to read and write but can sign only ()
- c) I studied up to class or I passed _____ examination ()

3. Family size (State the number of your family members including you)

Total Person

4. Land Size

Please mention your jackfruit land size..... hectare/acre/centi-

5. Number of Jackfruit Trees

How many jackfruit trees are there on your land?

6. Planting materials of Jackfruit (put tick √): Seed/ Seedling

7. Income from Jackfruit (Annual)

Please mention your annual income from jackfruit per year Tk

8. Training

Have you ever attended in any training program (formal training)?

Yes. / No

9. Skill in Jackfruit Cultivation (Experience)

For how many years have you been cultivating jackfruit?..... Years

10. Knowledge on Jackfruit Cultivation

Please answer the following questions .

Sl. No.	Questions	Assigned Score	Obtained Score
1	Name two varieties of jackfruit.	2	
2	How do you irrigate the jackfruit field?	2	
3	When and how much fertilizer do you apply to a jackfruit tree?	2	
4	How do you give training and pruning to the trees?	2	
5	How do you spray insecticides on jackfruit trees?	2	
6	Mention two diseases of jackfruit.	2	
7	Mention two ways of controlling insects.	2	
8	Mention the ways of controlling diseases.	2	
9	What will you do if the inflorescence is about to rot?	2	
10	Mention the symptoms of a mature jackfruit.	2	
11	When is it good to harvest jackfruit?	2	
12	How is the jackfruit harvested?	2	
13	How is the jackfruit graded and sorted?	2	
14	Why is the jackfruit produced in large quantity in your locality?	2	
Total =		28	

11. Use or importance of jackfruit [Put (√) marks]

Sl. No.	Use/importance	Farmers responses		
		Low (1)	Medium (2)	High(3)
1	Use as vegetable (green or raw)			
2	Use as fruits and food			
3	Use of seed as help out/supplementary food			
4	Use as fodder for animal			
5	Use as firewood and furniture			
6	Use as medicinal plant			

12. Price variation on market [Put (√) marks]

Sl.No	Category	Local market			National market		
		Low	Medium	High	Low	Medium	High
		1	2	3	1	2	3
1	Price						

13. Demand variation on market [Put (√) marks]

Sl. No	Category	Local market			National market		
		Low	Medium	High	Low	Medium	High
		1	2	3	1	2	3
1	Demand						

14. Problems faced by the farmers during jackfruit tree cultivation

Sl. No.	Problems	Nature of Problem faced				Strongly Disagreed
		Strongly agreed	Agreed	No opinion	Disagreed	
		4	3	2	1	
1	Fall of immature fruit					
2	Disease dissemination in inflorescence					
3	Rotten inflorescence due to insect					
4	Trees don't give jackfruit regularly					
5	Disease controlling problem					
6	Quick rot after harvesting					
7	Unavailability of transporting facilities					
8	Lower market price					
9	Damaged caused during marketing					
Total						

15. Farmer's opinions on jackfruit tree cultivation [Put (v) marks]

Sl. No	Farmers opinion on	Strongly agreed (4)	Agreed (3)	No opinion (2)	Disagreed(1)	Strongly Disagreed (0)
1	Possible to increase jackfruit cultivation even in existing situation					
2	Having enough economic importance of jackfruit cultivation					
3	Government facilities can be provided for commercial purpose					
4	Enough supply of jackfruit is possible if marketing system and exporting policy are developed here					
5	Demand and price low in local market and high in national market					
Total						

(Thank you for your cooperation)

Date:.....

.....
Signature of the interviewer

APPENDIX B

Computed co-efficient of correlation (r) between dependent and independent variables (N=80)

	X1	X2	X3	X4	X5	X6	X7	X8	X8	X9	X10	X11	X12	X13	X14	X15	X16
X1	1																
X2	.225*	1															
X3	.692**	.450**	1														
X4	.471**	.511**	.687**	1													
X5	.673**	.538**	.757**	.818**	1												
X6	.288**	.207	.178	.194	.318**	1											
X7	.151	.212	.373**	.419**	.326**	-.015	1										
X8	-.107	-.004	-.187	-.026	.052	-.108	.227	1									
X9	.645**	.540**	.615**	.639**	.748**	.338**	.364**	-.032	1								
X10	-.109	.049	-.170	-.174	-.243*	-.216	.119	.273*	-.259*	1							
X11	.344**	.348**	.295**	.314**	.520**	.296**	.183	.134	.369**	-.075	1						
X12	.745**	.203	.656**	.475**	.582**	.116	.356**	-.162	.471**	-.037	.129	1					
X13	.699**	.507**	.858**	.701**	.751**	.125	.443**	-.136	.605**	-.108	.312**	.682**	1				
X14	.670**	.347**	.667**	.601**	.603**	.132	.351*	-.219	.430**	-.007	.250*	.605**	.775**	1			
X15	.751**	.282*	.790**	.614**	.693**	.090	.432**	-.076	.639**	-.186	.081	.863**	.827**	.609**	1		
X16	.078	.171	.349**	.462**	.264*	.027	.260**	-.232*	.109	.102	.119	.301**	.347**	.434**	.239*	1	
Y	.201	.354**	.189	.273*	.368**	.111	.220*	.285*	.276*	.399**	.380**	.169	.154	.175	.110	.177	1

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

X1=Age,X2=Education,X3=Family size,X4=Farm land size,X5= No. of jackfruit trees,X6= Planting materials,X7= Income (annual),X8= Training,X9= experience,X10=knowledge,X11=importance,X12= Price variation local,X13= Price variation local,X14=Demand variation local,X15= Demand variation national,X16= Problems , Y= Farmers opinion about jackfruit tree cultivation