PROBLEM CONFRONTATION IN BETEL LEAF CULTIVATION BY THE FARMERS OF NATORE DISTRICT

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PROBLEM CONFRONTATION IN BETEL LEAF CULTIVATION BY THE FARMERS OF NATORE DISTRICT

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CERTIFICATE

This is to certify that the thesis entitled **'Problem Confrontation in Betel Leaf Cultivation by the Farmers of Natore District'** submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfilment of the requirements for the degree of **Master of Science in Agricultural Extension**, embodies the result of a piece of bonafide research work carried out by **Md. Younus Ali**, Registration number: **07-2206** 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 duly been acknowledged.

Dated:

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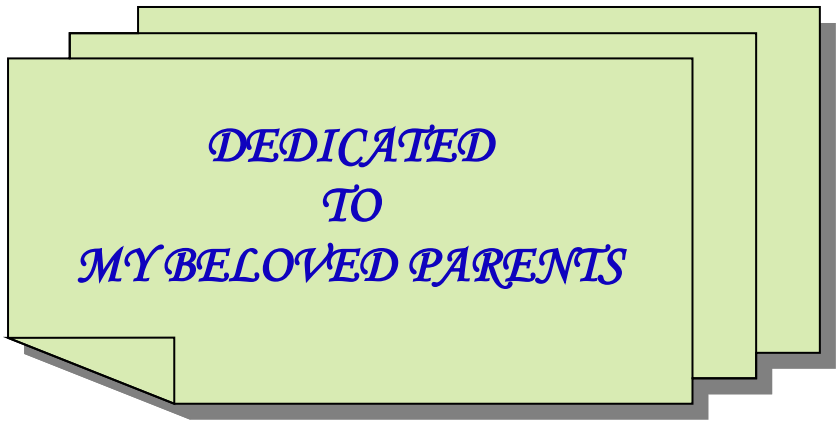
DEDICATED
TO
MY BELOVED PARENTS

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The Author

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ABSTRACT

The main objectives of the study was to determine the problem confrontation of the betel leaf farmers in betel leaf cultivation and also to explore the relationships between the selected characteristics of the betel leaf farmers and their problem confrontation in betel leaf cultivation. The study was conducted in the Gurudaspur and Baraigram upazila under Natore district. An update list of 978 farmers who were related to betel leaf cultivation from the selected upazilas was prepared with the help of Upazila Agricultural Officer of these localities. Around 10% of the populations were randomly selected as the sample of the study by using random sampling method. Thus, 98 betel leaf farmers constituted the sample of the study. A well structured interview schedule was developed based on objectives of the study for collecting information. The researcher himself collected data through personal contact. The independent variables were: age, level of education, family size, farm size, betel leaf cultivation area, family annual income, experience in betel leaf cultivation, knowledge on betel leaf cultivation, media exposure, cosmopoliteness, social organizational participation and problems in betel leaf cultivation. The dependent variable of this study was the Problem confrontation in betel leaf cultivation by the farmers of Natore District. Data collection was started in 12 August, 2014 and completed in 20 September, 2014. Among the respondents, the highest 56.12 percent betel leaf farmers belongs to the group of medium problem confrontation and the lowest percentage 20.42 percent in high problem confrontation. Pearson Product Moment Correlation Co-efficient between dependent and independent variable revealed that age, level of education, experience in betel leaf cultivation, knowledge on betel leaf cultivation, media exposure, cosmopoliteness, social organizational participation had significant positive relationships with problem confrontation of betel leaf farmers. Farm size, betel leaf cultivation area, family annual income had non significant positive relationships with problem confrontation of betel leaf farmers. On the other hand, problems in betel leaf cultivation had significant negative relationship with problem confrontation of betel leaf farmers and family size had non significant negative relationship under the present study. As per Problem Confrontation Index (PCI) arrangement of auto rickshaw, van as transport facilities for marketing positioned the 1st and arrangement of interest free loan from relatives and family savings in 12th.

CHAPTER I

INTRODUCTION

1.1 General Background

The Betel is the leaf of a vine locally known as pann belonging to the Piperaceae family. Betel leaves are used as a mild stimulant, an antiseptic and a breath-freshener. It is widely recognized for its medicinal properties though betel quid (a mixture of substances) with tobacco is strongly carcinogenic. An extensive research monograph by the World Health Organization reports that betel leaf is consumed as *betel quid* in Southeast Asian community worldwide. The betel quid contains betel leaf, areca nut and slaked lime, and may contain tobacco, cardamom, saffron, cloves, mustard or sweeteners according to local preferences (WHO, 1998).

As the betel plant originated from South and South East Asia, It is mostly cultivated in Asian countries like Bangladesh, India, Indonesia, Malaysia, Thailand, Myanmer, Laos, Combodia, Vietnam, Nepal, Philippines, Srilanka and Papua New Guinea. Total cultivated area under the crop in Bangladesh is about 14,175 hectare and the total annual production is about 72,500 tons (BBS, 2013). The average yield per hectare is 5.60 tons (Banglapedia, 2004). Betel leaf is produced almost in all parts of Bangladesh, though some districts like, Rajshahi, Natore, Chittagong, Barisal, Chuadanga, Rangpur are particularly famous for its production. The harvested leaves are consumed locally or exported to other parts of Asia, the Middle East, Europe, and the United States. Basically it is purchased and consumed by the people of Bangladesh, India and Pakistan. Betel leaf cultivation practice is linked up with livelihood in respect of production, and socio-economic aspect. Production link is related to direct financial sharing to livelihood of the betel leaf farmers. By using modern agricultural practices in betel leaf cultivation, betel leaf farmers can earn more economic return from the same unit of land against traditional agriculture. Unemployment problem can be reduced in the rural areas of Bangladesh by betel leaf cultivation.

Betel leaf farmers prepare a bamboo-framed platform called “paan barouj” where betel leaf vine creeps and grows. The *barouj* is fenced with bamboo or jute sticks and coconut leaves. The vine is betel leaf belongs to the family Piperaceae. The vine is a dioecious, shade loving perennial root climber. There are about 100 varieties of betel vine in the world, of which about 40 are found in India and 30 in West Bangal (Sumanta, 1994). Betel requires high land and fertile soil. Waterlogged, saline and alkaline soils are not suitable for its cultivation. The tilth soil is divided into furrows of 10 to 15 m length, 75 cm width and 75 cm depth. Oilcakes, manure, dry leaves are thoroughly incorporated with the topsoil of the furrows. The creeper cuttings are planted both at the beginning and end of the monsoon season. Proper shade and irrigation are essential for the successful cultivation of this crop. It needs frequent light and irrigation but cannot tolerant excessive heat and standing water. Dried leaves, wood ash and cow dung slurry are applied to the furrows at a regular interval which are advantageous for the better growth of the betel leaf. Within 3 to 6 months after planting, the vines reach 150 to 180 cm height and they produce branch. Harvest begins when lower leaves of the vines become matured and it continues 15 to 30 days interval. Harvesting of betel leaf in the month of December, January, February, March, April and May is highly profitable to the betel leaf farmers due to its high price.

For getting the improved practices adopted by the farmers in betel leaf cultivation, at least two things are necessary. Firstly, the betel leaf farmers must be aware of the benefits of the betel leaf cultivation and secondly, the betel leaf farmers should not face difficulty in obtaining necessary conditions and services to adopt the improved practices for betel leaf cultivation. Generally betel leaf farmers confront many problems during betel leaf cultivation. In general, problem refers to some difficulties when a betel leaf farmers experiences from practical situation and wants to get a solution for the same. Betel leaf farmers face different problems. The problems can be classified as followings-

a. Inputs problems: vines, bamboo stick, fertilizer, compost or cow dung etc.

b. Soil problems: weed, soil fertility, soil productivity, soil type etc.

c. Climatic problems: Rainfall, temperature, light, humidity etc.

d. Disease and pest problems: Two major diseases are leaf spot disease and root rot disease.

e. Physical and physiological problems: Mechanical injury, high desiccation rate, dropping off mature leaves during winter season etc.

f. Management problems: Land preparation, weeding, irrigation, fertilizer management, labour management and post harvest management like storage facilities etc

g. Economic problems: Lack of capital, loan or credit, crop insurance, high labour cost etc.

h. Marketing problems: Low market prices, middlemen, transport problem etc.

So long the problem confrontation, researchers used to find out problems with degree of severity as perceived by the concerned respondents. But the researcher of this study had a research design to describe how each of the problem was tackled by them during betel leaf cultivation. Natore district is a suitable place for betel leaf cultivation and there are a significant number of betel leaf farmers and they confront different problems in betel leaf cultivation. But little effort has been made to undertake systematic investigation in this respect. These facts indicate the need for conducting a research study entitled, ‘Problem Confrontation In Betel Leaf Cultivation By The Farmers of Natore District’.

1.2 Statement of the Problem

Betel leaf is one of the major cash crops in Natore District of Bangladesh. It signifies their economic condition and living standard. The betel leaf grows experience a number of problems which emerge from management practices, technological issues, marketing system and environmental aspects. In the name of problem confrontation many studies were conducted by many researchers, which were confined to identification of problem along with their severity only. To the meaning of problem confrontation was just searching and list down the problems of concerned issues. In facts, the meaning of problem confrontation should be different. Some researchers have view that the problem confrontation should describe the methods of tackling problems. The betel leaf farmers of Natore district are congenial no problem can go unchallenged. So, their selfhood inspire them to develop device for resolving betel leaf cultivation problems. Where there is problem there is also solution. Reasonably, betel leaf farmers of Natore district identify problems and tackle the problems giving some degree of emphasis. In the light of the foregoing discussion the researcher undertook a research problem entitled 'Problem Confrontation In Betel Leaf Cultivation By The Farmers of Natore District'. The purpose of this study was to have an understanding of the problems confronted by the betel leaf farmers in respect of betel leaf cultivation activities. The study also explored relationship of the selected characteristics of the betel leaf farmers with their problem confrontation in betel leaf cultivation. In this connection, the following research questions were raised out for solution-

1. What problems are experienced in betel leaf cultivation by the farmers?
2. What strategies they use to resolve the problem?
3. What are the major components in which farmers faced problems in betel leaf cultivation activities?
4. What are the personal, economic, social and psychological characteristics of the betel leaf farmers?
5. To what extent of the characteristics of the betel leaf farmers are related with their problem confrontation in betel leaf cultivation activities?

1.3 Specific Objectives of the Study

Generally betel leaf farmers of Natore district confront many problems during betel leaf cultivation. To find out the problem confrontation of betel leaf farmers in Natore district the following specific objectives were selected in order to give proper direction of the study:

1. To determine the problems confrontation techniques adopted by the betel leaf farmers
2. To determine and describe the selected characteristics of the betel leaf farmers. The selected characteristics were:
    - Age
    - Level of education
    - Family size
    - Farm size
    - Betel leaf cultivation area
    - Family annual income
    - Experience in betel leaf cultivation
    - Knowledge on betel leaf cultivation
    - Media exposure
    - Cosmopoliteness
    - Social organizational participation
    - Problems in betel leaf cultivation
3. To explore the relationship between the selected characteristics of the betel leaf farmers and their problem confrontation in betel leaf cultivation.

1.4 Justification of the study

Problem in betel leaf cultivation is an important issue for the betel leaf farmers . Problem may be technical, economic, marketing and skill oriented. Due to the problems betel leaf cultivation is in morbid condition all our Bangladesh. In this circumstances, farmers count economic loss with grief. However, there are some innovative and venturesome farmers who confront the problems with the help of extension service and applying their own experiences. They have knowledge about problem confrontation device acquired from many sources. Farmers of Natore district confront problems of betel leaf cultivation what mechanism is used against what problem? So, the experiences of problem confrontation by betel leaf farmers of Natore district could be leaning avenue for other the farmers of other districts. Considering the above mentioned points the researcher has became highly interested to conduct research entitled 'Problem Confrontation in Betel Leaf Cultivation by the Farmers of Natore District'.

1.5 Assumptions of the Study

An assumption has been defined as the supposition that an apparent fact or principle is true in the light of the available evidence (Goode, 1945). The researcher had the following assumptions in mind while undertaking this study:

- The respondents betel leaf farmers, included in the sample were capable of furnishing proper responses to the questions included in the interview schedule.
- Views and opinions furnished by the respondents were the representative views and opinions of the whole population of the study.
- The responses furnished by the respondents were reliable and realistic. The researcher was well adjusted to the socio economic condition of the study area. So the respondents gave their opinions without any hesitation.
- All the data concerning the independent and dependent variables were normally and independently distributed with their respective means and standard deviation.

- The findings of the study will have general applications to other parts of the country with similar personal, socio-economic and cultural conditions.

1.6 Limitation and Scope of the Study

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

i) The study was confined to the betel leaf farmers of Gurudaspur and Baraigram upazila under Natore district.

ii) Population for the present study was kept confined within the Gurudaspur and Baraigram upazila under Natore district.

iii) There are many problems which may arise in betel leaf cultivation. But, only twelve selected problems have been taken into consideration.

iv) There were many characteristics of the betel leaf farmers but only twelve characteristics of them were selected for investigation.

v) For information about the study, the researcher depended on the data furnished by the selected respondents' during their interview.

vi) Facts and figures collected by the researcher applied to the situation prevailing during the year 2014.

Findings of the study will be particularly applicable in a selected area of Gurudaspur and Baraigram upazila under Natore district. However, the findings may also have applications for other areas of Bangladesh where the physical, socio-economic and cultural condition do not differ much from those of the study area. Thus the findings will be helpful to the researchers, planner, policy makers and extension workers for programme development in view to increase the yield and quality of betel leaf in our country.

1.7 Definition of Terms

A concept is an abstract of observed thing; events or phenomenon or in other words, it is a short hand representation of variety of facts. A researcher needs to know the meaning and contents of every term that used for a study. It should clarify the issue as well as explain the fact to the investigator and readers. However, for clarity of understanding, a number of key concepts/terms frequently used throughout the study defined are interpreted as follows:

Age

Age of a respondent is defined as the span of life and is operationally measured by the number of years from his/her birth to the time of interviewing.

Level of Education

Empirically it was defined to the development of desirable changes in knowledge, skill and attitudes in an individual through reading, writing, walking, observation and other selected activities. It was measured on the basis of classes a respondent's has passed from a formal educational institution.

Family size

Family size refers to the number of member including the respondent himself/herself, his/her wife/husband children and other permanent dependents, who live and live together in a family unit.

Farm size

The term related to the hectare of land owned by a respondent's on which he carried his farming activities, the area being estimated in terms of full benefit to the farmers. A farmer was considered to have full benefit from cultivated area either owned by himself or obtained or, lease from others and half benefit from the area which was either cultivated by borga or given to others for cultivation on borga basis.

Betel leaf cultivation area

Betel leaf cultivation area means what amount of land brought under betel leaf cultivation by respondents.

Family annual income

Annual income of a respondent referred to the total earning by him and other members of his/her family from agricultural (field crop, fish, livestock, poultry, fruits and vegetables and timbers, etc.) and other sources (service, business, etc.) during a year. Annual family income of the respondent also included the cost of maintaining his family. It was expressed in Taka.

Experience in betel leaf cultivation

Experience in betel leaf cultivation means the experiences of betel leaf farmers in betel leaf cultivation.

Knowledge on betel leaf cultivation

Literally knowledge means knowing or what one knows about a subject, fact, person etc. Knowledge on betel leaf cultivation referred to the understanding of the betel leaf farmers about the different aspects of betel leaf cultivation.

Media exposure

This term referred to an individual's access to or contact with the different communication media and source being used for dispersion of new technologies and for other perspectives.

Cosmopoliteness

Cosmopoliteness of a respondent define as visit inside or outside of one own social system and frequency of visit.

Social organizational participation

Social organizational participation of the respondent referred of his nature of participation in different social organizations before the time of interviewing.

Problems in betel leaf cultivation

Problem in betel leaf cultivation means any difficult situation which requires some actions to minimize the gap between “what ought to be” and “what is” The term problem in betel leaf cultivation refers to extent of different problems faced by the betel leaf farmers in betel leaf cultivation.

Problems confrontation

Problem confrontation refers different problem as perceived by the farmers.

CHAPTER II

REVIEW OF LITERTURE

In conducting research the review of literature gives the clear and concise direction of the researcher in various aspect of conducting the research. In this chapter, review of literatures relevant to the study was presented. There was serious dearth of literature with respect to research studies on this aspect. So the directly related literatures were not readily available for this study. Some researchers addressed various aspects of problem confrontation in various crops. A few of these studies relevant to this research are briefly discussed in this chapter under the following three sections:

Section 1: Literature related to problems faced by the respondent's in different aspects of agriculture

Section 2: Review concerning the relationship between selected characteristics of the respondents and their problem confrontation

Section 3: Conceptual framework of the study

2.1 Literature related to problems faced by the respondent's in different aspects of agriculture

King (1980) showed that the problems of cotton development project in Gambia were dominated by three main factors that are: (1) low yield, (2) high labour input (3) the relative price paid to the farmers for groundnut and cotton. There were no technical reasons why cotton cannot be grown.

Marothia (1983) conducted a study to find out the constrains in the adoption of paddy technologies in two villages in Raipur block, Madhya Pradesh, India. The findings revealed that the majority of farmers still adopt a partial package of recommendations, mainly due to the high cost of input, financial limitations and risk of crop failure. Inadequate supportive input facilities were found to be responsible for the slow adoption of paddy technology.

Arya and Shah (1984) conducted a study in the mid-Himalayan Region of Uttar Pradesh of India to find out the existing and potential level of food production and main constraints on the adoption of new technology for rainfed agriculture. The main constraint identified were (1) small and skewedly distributed holdings, (2) fragmented and scattered holdings, (3) shortage of labour, (4) lack of availability of inputs and funds and (5) lack of education, training and extension especially for women.

Raha *et al.* (1986) identified some common problems of cotton cultivation as perceived by the farmers in Bangladesh. Those were lack of suitable land, lack of irrigation facility, shortage of labour, shortage of cash money, lack of technical knowledge, lower price of cotton and non-availability of seed, insecticide and fertilizer.

Zinyama (1988) conducted a relative observation to find out the farmers' perception of the constraints against increased crop production in the subsistence communal farming sector of Zimbabwe. Five of the most frequently cited constraints were (1) lack of money with which to purchase seasonal agriculture inputs, particularly fertilizer (2) lack of basic farming implements, notably the ox driven single furrow plough (3) lack of draught cattle, (4) inadequate arable land and (5) inadequate family labour for agricultural work.

Kher and Halyal (1988) administered a research work to identify the constraint in adoption of sugarcane production technology. The most important constraint identified regarding the adoption of input in sugarcane production technology were irregular and insufficient electricity supply, small size of holding for green manuring inconvenience of inter cropping due to weeds, high cost of farm fuel, scare irrigation facility, absence of location specific recommendations for earthing up, lack of drought resistant varieties and lack of technical knowledge about plant protection and chemical fertilizer.

Ramachandran and Sripal (1990) identified different constraint in adopting of dry land technology for rainfed cotton in Kamaraz district, Tamilnadu, India. They found that farmers faced constraints which included insufficient rainfall susceptibility of pest and diseases, lack of experience, unavailability of inputs in time, lack of knowledge, in sufficient livestock, risk due to failure of monsoon , high cost etc.

Chander *et al.* (1990) in their study identified constraints in potato cultivation. Main constraints were ignorance about improved cultivars and cultivation practice, ignorance about time and number of irrigations, ignorance about scientific method of sowing, lack of guidance of marketing of potato, high cost of improved cultivars, high cost of fertilizers, pesticide and irrigation, lack of enough space for storing potatoes scientifically and so on.

Freeman and Breth (1994) conducted a study on productivity of agricultural systems in the West African savanna. The study showed several constraints in farming practices such as intensified land use, fallow period decline and crop cultivation spreading ecologically fragile lands. In the absence of appropriate resource management technologies, those practices inevitably led to degradation of the resource base with important implication with soil productivity, household food security and rural poverty.

Gumisiriza *et al.* (1994) showed several constraints of wheat production in Uganda. Those were: traditional farming practices, unavailability or lack of improved cultivars, information and technology transfer, rust and foliar diseases and ineffective communication between research stations.

Muttaleb *et al.* (1998) revealed that among different constraints, high fertilizer cost, high seed cost, lack of quality seed, lack of awareness, lack of technological knowledge and low price of potato at harvest period were perceived as barriers for the adoption of potato technologies.

Alam *et al.* (2000) conducted a survey on jute crops in seven districts in Bangladesh and found that scarcity of quality seeds, high labour wage and low market price of fiber were the major constraints of jute production.

Ismail (2001) conducted a study on problem faced by the farm youth of haor area of Mohongonj Upazila. The study revealed six top problems in rank order which were: (1) no arrangement of loan for the farm youth for fishery cultivation, (2) lack of government programs in agriculture for the farm youth, (3) absence of loan giving agencies for establishing farm in locality, (4) general people face problem for fishery due to government leasing of Jalmohal, (5) lack of government programmes for establishing poultry farm and (6) lack of agricultural loan for the farm youth.

Pramanik (2001) made an extensive study on 24 problems of farm youth in Mymensingh district relating to different problem in crop cultivation .Out of 24 problems the top 4 problems in rank order were: (1) local NGOs take high rate of interest against a loan, (2) lack of agricultural machinery and tools, (3) lack of cash and (4) financial inability to arrange improved seeds, fertilizer and irrigation.

2.2 Review concerning the relationship between selected characteristics of the respondent and their problem confrontation

2.2.1 Age and problem confrontation

Hossain (1985) in a study on landless labourers in Bhabakhali Union of Mymensingh district found that there was no relationship between the landless labourers and their problem confrontation. Similar findings were obtained by Rahman (1995), Ali (1999), Rashid (1999), Pramanik (2001), Ahmed (2002) and Salam (2003) in their respective studies.

Kashem (1997) conducted study on the landless labourers of Barakhata Union under Rangpur district and determined the relationship between age of the landless labourers and their problem confrontation. He found no relationship between age of the landless labourers and their problem confrontation.

Mansur (1989) found that age of the farmers had no significant relationship with the feeds and feeding problem confrontation.

Bhuiyan (2002) in his study found a positive and significant relationship between age of the farmers and their constraints in banana cultivation. Similar findings were obtained by Rahman (1996) in his respective study.

Rashid (1999) found that age of the rural youth had significant negative relationship with problem confrontation in selected agricultural production activities.

2.2.2 Level of education and problem confrontation

Kashem (1997) in his study found a significant negative relationship between education of the landless labourers and their problem confrontation.

Islam (1987) in his study found a significant and negative relationship between education of the farmers and their problem confrontation on artificial insemination. Similar findings were obtained by Mansur (1989), Rahman (1995), Haque (1995), Rahman (1996), Karim (1996), Faroque (1997), Pramanik (2001), Ahmed (2002), Hossin (2002), Bhuiyan (2002) and Salam (2003) in their respective studies.

Haque (2001) found a significant negative relationship between education and problem confrontation of the Farmers Field School (FFS) in practicing IPM.

2.2.3 Family size and problem confrontation

Haque (1995) found that there was no significant relationship between family size and problem confrontation of the Mohila Bittaheen Samabaya Samittee. Similar findings were obtained by Rashid (1999), Bhuiyan (2002), Hossain (2002) and Ahmed (2002) in their respective studies.

Salam (2003) in his study found a positive significant relationship between family size and their problem confrontation in adopting environmentally friendly farming practices.

2.2.4 Farm size and problem confrontation

Kashem (1997) found a significant negative relationship between borga farm size of the landless labourers and their problem confrontation.

Hossain (1985) in his study found a significant relationship between borga farm size of the landless labourers and their problem confrontation.

Hoque (2001) revealed that significant positive relationship existed between farm size and problem confrontation of the FFS farmers in practising IPM.

Rashid (2003) found that farm size of the rural youth had no relationship with problem confrontation in selected agricultural activities.

2.2.5. Betel leaf cultivation area and problem confrontation

The researcher could not find any literature regarding relationship between betel leaf cultivation area and problem confrontation of the betel leaf farmers.

2.2.6 Family annual income and problem confrontation

Kashem (1977) in his study examined the relationship between income of the landless labourers and their problem confrontation. Though the relationship was not statistically significant, the data indicated an appreciable negative trend between the two variables.

Saha (1983) found in his study a negative relationship between income of the farmers and their poultry problem confrontation.

Hossain (1985) found a significant relationship between income and problem confrontation of the land less labourers.

Islam (1987) reported that the relationship between income and artificial insemination problem confrontation was negatively significant.

Raha (1989) found in his study that income of the farmers had no significant relationship with their irrigation problem confrontation.

Masur (1989) did not find any significant relationship between income of the farmers and their problem confrontation in feeds and feeding cattle. However, the trend of the relationship was negative.

2.2.7 Experience in betel leaf cultivation and problem confrontation

The researcher could not find any literature regarding relationship between experience in betel leaf cultivation and problem confrontation of the betel leaf farmers.

2.2.8 Knowledge on betel leaf cultivation and problem confrontation

The researcher could not find any literature about relationship between knowledge on betel leaf cultivation and problem confrontation of the betel leaf farmers'.

2.2.9 Media exposure and problem confrontation

Raha (1989) Found that media exposure of the farmers had no significant relationship with immigration problem confrontation. However, the relationship showed a tendency in the negative direction.

Rahman (1995) in his study concluded that media exposure of the farmers had significant negative relationship with their faced problem in cotton cultivation. Similar findings were obtained by Rahman (1996), Faruque (1997), Pramanik (2001), Hossain (2002), Bhuiyan (2002) and Salam (2003) in their respective studies.

The study of Ismail (2001) revealed that there was no significant relationship between media exposure of the farmers and their agricultural problem confrontation. Similar findings were obtained by Hoque (2001) in his study.

2.2.10 Cosmopoliteness and problem confrontation

Rashid (1975) found that there was a negative relationship between cosmopoliteness of the farmers and their agricultural problem confrontation.

Kashem (1977) found that there was no significant relationship between cosmopoliteness of the landless labourers, but existed a negative trend between the two variables.

2.2.11 Social organizational participation and problem confrontation

Mahboob (1966) undertook a study on the personality characteristics of the main county extension personnel in Wisconsin and based on finding of his study he concluded that participation in society is desirable for extension worker as it developed leadership qualities. The conclusion suggested that social participation of individuals may lessen their problem confrontation and thus enhance their performance.

Rashid (1975) concluded in his study that social participation of the farmers had no significant relationship with their agricultural problem confrontation.

Ali (1978), Saha (1983), Sarker (1983) and Mansur (1989) found in their studies that social participation of the farmers had a significant negative relationship with the agricultural constraints faced. On the other hand Islam (1987) and Raha (1989) found no significant relationship with their agricultural constraints faced.

Rahman (1995) found in his study that there was no relationship between the social participation of the farmers and their faced constraints in cotton cultivation.

2.2.12 Problems in betel leaf cultivation and problem confrontation

The researcher could not find any literature about relationship between problems in betel leaf cultivation and problem confrontation of the betel leaf farmers.

2.3 Conceptual framework of the study

In scientific research, selection and measurement of variables constitute an important task. The hypothesis of a research while constructed properly consist at least two important elements i.e.: a dependent variable and an independent variable. A dependent variable is that factor which appears, disappears or varies as the researcher introduces, removes or varies the independent variables (Townsend, 1953)**.** An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon. Variables together are the causes and the phenomenon is effect and thus, there is cause effect relationship everywhere in the universe for a specific events or issues.

The conceptual framework of Rosenberg and Hovland (1960) was kept in mind while making structural arrangements for the dependent and independent variables. This study is concerned with the 'Problem Confrontation in Betel Leaf Cultivation by the Farmers of Natore District'. Thus, the problem confrontation in betel leaf cultivation by the farmers of Natore district was the dependent variable and 12 selected characteristics of the betel leaf farmers were considered as the independent variables. Problem confrontation of betel leaf (Paan) farmers may be affected through interacting forces of many independent variables. It is not possible to deal with all of the independent variables in a single study. It was therefore, necessary to limit the independent variables, which include age, level of education, family size, farm size, betel leaf cultivation area, family annual income, experience in betel leaf cultivation, knowledge on betel leaf cultivation, media exposure, cosmopoliteness, social organizational participation and problems in betel leaf cultivation for this study.

Considering the above mentioned discussion, a conceptual framework has been developed for this study, which is diagrammatically presented in the following Figure 2.1.

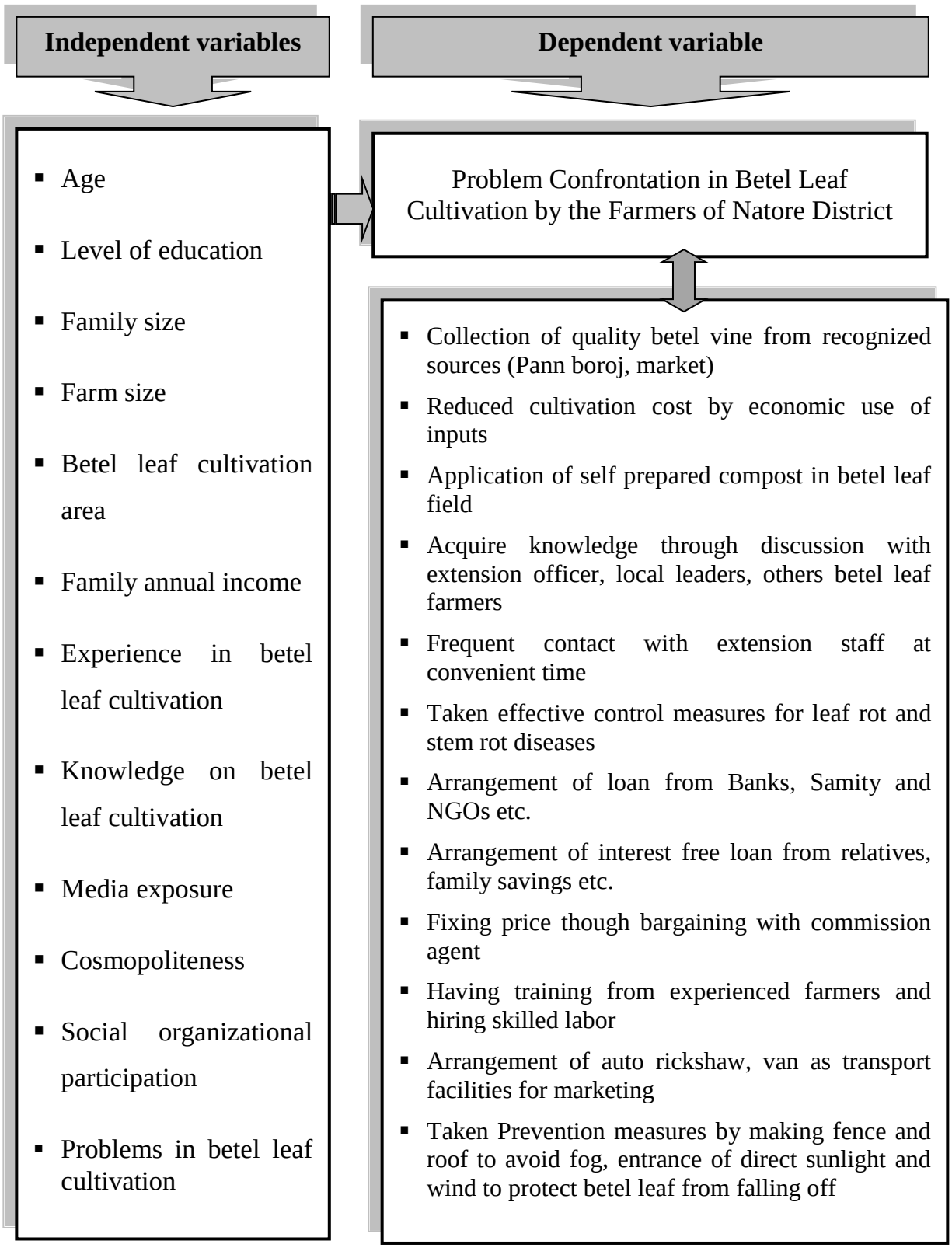

Figure 2.1 The conceptual framework of the study

CHAPTER III

METHODOLOGY

Methodology enables the researcher to collect valid information. It is impossible to conduct research work smoothly without proper methodology and it is very difficult to address the objectives with a scientific manner. It requires a very careful consideration on the part of the researcher to collect valid and reliable data and to analyze the same for meaningful conclusion. A sequential description of the methodologies followed in conducting this research work has been presented in this chapter.

3.1 Locale of the study

1. Gurudaspur and Baraigram upazila under Natore district were selected purposively for the study.
2. One union from each upazila was selected randomly.
3. Two villages from each union were selected randomly.

Multistage random sampling technique is used for selecting locale of the study.

3.2 Sample size

Betel leaf farmers of Chapila and Balia villages of Gurudaspur and Joari and Khudro Kasutia villages of Baraigram upazilas under Natore district constituted the population of the study. An update list of 978 betel leaf farmers was prepared with the help of Upazila Agricultural Officers of these localities. At the rate of 10% out of 978 total population i.e. 98 betel leaf farmers were selected randomly. Thus, 98 betel leaf farmers constituted the sample of the study. A reserve list of 15 farmers was also prepared by the same method so that the respondents of this list could be used for interview if the respondents included in the original sample were not available at the time of data collection. The distribution of the population sample and number of respondent farmers in the reserve list are given in Table 3.1.

Table 3.1 Distribution of the population sample and number of betel leaf farmers in the reserve list

Name of the upazilas	Name of unions	Name of villages	No. of betel leaf farmers	No. of betel leaf farmers included in the sample	No. of betel leaf farmers in the reserve list
Gurudaspur	Chapila	Chapila	291	29	5
		Balia	238	24	4
Baraigram	Joari	Joari	220	22	3
		Khudro Kasutia	229	23	3
Total	02	04	978	98	15

3.3 The research instrument

A well structured interview schedule was developed based on objectives of the study for collecting information exerting containing direct and simple questions in open form and close forms. Appropriate scales were developed to measure both independent and dependent variables.

The questionnaire was pre-tested with ten betel leaf farmers in actual situation before finalized it for collection of data. Necessary corrections, additions, alternations, rearrangements and adjustments were made in the interview schedule based on pretest experience. The questionnaire was then printed and multiplied in its final form. A copy of the interview schedule is presented as Appendix I.

3.4 Measurement of variables

The variable is a characteristic, which can assume varying, or different values in successive individual cases. A research work usually contains at least two important variables viz. independent and dependent variables. An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon. A dependent variable is that factor which appears, disappears or varies as the researcher introduces, removes or varies the independent variable (Townsend, 1953). In the scientific research, the selection and measurement of variable constitute a significant task. Following

this conception, the researcher reviewed literature to widen this understanding about the natures and scopes of the variables relevant to this research. At last he had selected 12 independent variables and one dependent variable. The independent variables were: age, level of education, family size, farm size, betel leaf cultivation area, family annual income, experience in betel leaf cultivation, knowledge on betel leaf cultivation, media exposure, cosmopoliteness, social organizational participation and problems in betel leaf cultivation. The dependent variable of this study was 'Problem Confrontation in Betel Leaf Cultivation by the Farmers of Natore District'. The methods and procedures in measuring these variables are presented below:

3.5 Measurement of independent variables

The 12 characteristics of the betel leaf farmers mentioned above constitute the independent variables of this study. The following procedures were followed for measuring the independent variables.

3.5.1 Age

Age of respondent betel leaf farmers was measured by the period of time from their birth to the time of conducting interview and it was measured in terms of complete years on the basis of their response. A score of one (1) was assigned for each year age.

3.5.2 Level of education

Level of education was measured in terms of class passed by respondent betel leaf farmers. If a respondent received education from any educational institute or recognized the school or college or university, their education was assessed in terms of year of schooling, i.e. one (1) score was given for one year of schooling. For example, if the respondents passed the final examination of class V, their education score was taken as 5. If the respondents had education outside of school and the level of education was equivalent to class V, then their education score was taken as 5. Each illiterate person was given a score of zero. The respondent

who did not know how to read or write but able to sign only was given a score of 0.5.

3.5.3 Family size

The family size of a respondent was measured in terms of actual number of members in his/her family including himself/herself, spouse, children, brothers, sisters, parents and other person who jointly live and ate together during the period of interviewing.

3.5.4 Farm size

Farm size of respondent referred to the total area of land on which his/her family carried out farming operation and received full benefit for his family. It was measured in hectares for each respondent using the following formula:

$$FS = A + B + {}^{1}/_{2}\,(C + D) + E + F$$

Where,

FS = Farm size

A = Area under homestead

B = Area under own cultivation

C = Area given to others on share cropping

D = Area taken from others on share cropping

E = Area taken from others on lease

F = Fallow land

3.5.5 Betel leaf cultivation area

Betel leaf cultivation area of respondent farmers referred to the total area of land on which his/her family carried out betel leaf cultivation and it was measured in hectares for each respondent.

3.5.6 Annual income

The term annual income refers to the annual gross income of a respondent and the members of his/her family from different sources. It was expressed in taka. In measuring this variable, total earning in taka of an individual respondent was

converted into score. A score of one was given for every one thousand taka. The method of ascertaining income form involved three phases. Firstly, the yield of all crops in the preceding year including betel leaf was noted and converted into taka, secondly, income attained from domestic animal, poultry and fish resources. Thirdly, non-agricultural sources of income included earning form service, business, day labor and other family members. Then added togather all types of income.

3.5.7 Experience in betel leaf cultivation

Experience in betel leaf cultivation score of a respondent was obtained by the extent of experience in the various aspects as vine selection, intercultural operations, disease control, harvest, betel leaf grading and marketing.

Following scores were assigned for each aspect of experience in betel leaf cultivation:

Nature of experience	Scores assigned
Low experience	1
Medium experience	2
Good experience	3
High experience	4

Thus, the experience in betel leaf cultivation score could range ranged from 6 to 24 where ‘6’ indicated low experience and 24 indicated high experience in betel leaf cultivation.

3.5.8 Knowledge on betel leaf cultivation

Knowledge on betel leaf cultivation of the betel leaf farmers referred to the knowledge gained by the respondent in betel leaf cultivation activities. Fourteen questions on different aspect of betel leaf cultivation were asked to the respondent to ascertain their knowledge score. The score was assigned as 2 for full correct answer and zero (0) for incorrect or no answer for each question. Partial score

was assigned for partial correct answers. Thus knowledge on betel leaf cultivation scores of the respondents could range from 0 to 28.

3.5.9 Media exposure

Media exposure of betel leaf farmers was obtained by the extent of exposure in the various media/sources. The respondent was asked to response against 10 different sources of media.

Following scores were assigned for each of 10 media .

Extent of exposure	Scores assigned
Not at all	0
Rarely	1
Occasionally	2
Often	3
Regularly	4

Thus, the media exposure scores of betel leaf farmers could range from 0 to 40 where ‘0’ indicated no exposure and 40 indicated very high media exposure.

3.5.10 Cosmopoliteness

It was computed for each respondent betel leaf farmers to determine his/her degree of cosmopoliteness on the basis of visits to 7 selected places external to his/her own social system. The scale use for computing the cosmopoliteness scores is presented below:

Extent of visit	Scores
Not at all	0
Rarely	1
Occasionally	2
Frequently	3
Regularly	4

Scores obtained for visits to each of the above seven selected places were added together to get the cosmopoliteness score of a respondent. Thus, cosmopoliteness score of the respondents could range from 0 to 28, while 0 indicated no cosmopoliteness and 28 indicated highest cosmopoliteness.

3.5.11 Social Organizational participation

Social organizational participation of respondent was measured on the basis of the nature of their participation in 8 selected organizations. Final score was computed by adding all the scores of selected organizations.

Following scores were assigned for nature of participation:

Nature of participation	Scores assigned
No participation	0
Participation as general member	1
Participation as executive member	2
Participation as executive officer	3

The social organizational participation score could range from 0 to 24 where 0 indicated no participation and 24 indicated very high social organizational participation.

3.5.12 Problems in betel leaf cultivation

Problems in betel leaf cultivation was measured on the basis of extent of problems faced by the farmers on different aspects of betel leaf production. The following scores were assigned against each of the problems:

Nature of problems	Scores assigned
Very low	1
Low problem	2
Medium problem	3
High problem	4
Very high problem	5

Thus, problems in betel leaf cultivation score of a respondent could range from 12 to 60 where 12 indicated very low and 60 indicated very high problem faced in betel leaf cultivation.

3.6 Measurement of dependent variable

3.6.1 Twelve (12) problem confrontation technique of the farmers

Problems of betel leaf cultivation were identified after through discussion with betel leaf farmers, progressive farmers and Agricultural Extension Officers and Professors. Problems confrontation were as follows:

1. Collection of quality betel vine from recognized sources (Pann boroj, market).
2. Reduced cultivation cost by economic use of inputs.
3. Application of self prepared compost in betel leaf field.
4. Acquire knowledge through discussion with extension officer, local leaders, others betel leaf farmers.
5. Frequent contact with extension staff at convenient time.
6. Taken effective control measures for leaf rot and stem rot diseases.
7. Arrangement of loan from Banks, Samity and NGOs etc.
8. Arrangement of interest free loan from relatives, family savings etc.
9. Fixing price though bargaining with commission agent.
10. Having training from experienced farmers and hiring skilled labor.
11. Arrangement of auto rickshaw, van as transport facilities for marketing.
12. Taken prevention measures by making fence and roof to avoid fog, entrance of direct sunlight and wind to protect betel leaf from falling off.

3.6.2 Problem confrontation by betel leaf farmers

3.6.3 Problem confrontation of betel leaf farmers was measured by computing problem confrontation score according to extent of problem

confrontation strategies to cope with each of the 12 selected problems in betel leaf cultivation. The possible problem confrontation strategies were determined from literatures and discussion with betel leaf farmers, extension worker and concerned specialist. Following scores were assigned for implementing problem confrontation strategies:

Extent of problem confrontation strategies	Score assigned
Very good	5
Good	4
Medium	3
Low	2
Very low	1

Thus, the problem confrontation score of a respondent could range from 12 to 60 where 12 indicating vely low problem confrontation and 60 indicating very good problem confrontation in betel leaf cultivation.

3.7 Hypothesis of the study

The following null hypothesis was undertaken for the present study. There is no significant relationship between the selected characteristics of betel leaf farmers with the problem confrontation in betel leaf cultivation. The related characteristics are age, level of education, family size, farm size, betel leaf cultivation area, family annual income, experience in betel leaf cultivation, knowledge on betel leaf cultivation, media exposure, cosmopoliteness, social organizational participation and problems in betel leaf cultivation.

3.8 Data collection procedure

The researcher himself collected the data from the sample respondents through personal contact with the help a pre-tested interview schedule. Whenever any respondent faced difficulty in understanding questions, more attention was taken to explain the same with a view to enabling the farmers to answer properly. No serious problem was faced by the investigator during data collection but obtained cooperation from the respondents. Data collection was started in 12 August, 2014

and completed in 20 September, 2014. The investigator himself collected data on the basis of objectives to test the hypothesis.

3.9 Data processing

For data processing and analysis the following steps were followed:

3.9.1 Compilation of data

After completion of field survey all the interview schedule were compiled, tabulated and analyzed according to the objectives of the study. In this process all the responses in the interview schedule were given numerical coded values. The responses to the question in the interview schedule were transferred to a master sheet to facilitate tabulation. Tabulation was done on the basis of categories developed by the investigator himself.

3.9.2 Categorization of respondents

For describing the various independent and dependent variables the respondents were classified into various categories. In developing categories the researcher was guided by the nature of data and general consideration prevailing on the social system. The procedures have been discussed while describing the variable in the subsequent sections of next chapter.

3.10 Data analysis

Collected data complied, coded, tabulated and analyzed in accordance with the objectives of the study. Various statistical measures such as frequency counts, percentage distribution, average, and standard deviation were used in describing data. SPSS (version 11.5) computer programme were used for analyzing the data. The categories and tables were used in describing data.

For determining the relationship of the selected characteristics of the respondent with their problem confrontation in betel leaf cultivation, Pearson Product

Moment Correlation was used. Five percent (0.05) level of probability was used as the basis for rejecting any null hypothesis.

CHAPTER IV

RESULTS AND DISCUSSION

The recorded observations in accordance with the objective of the study were presented and probable discussion was made of the findings with probable justifiable and relevant interpretation under this chapter. The chapter content in three (3) sections. The first section of this chapter deals with the characteristics of the betel leaf farmers. The second section deals with the problem confrontation of the betel leaf farmers. The third section deals with the relationship between individual characteristics of the betel leaf farmers with their problem confrontation in betel leaf cultivation.

4.1 Characteristics of the betel leaf farmers

For study the problem confrontation of betel leaf farmers various interrelated characteristics of the betel leaf farmers were collected under the present study. It was therefore, hypothesized that the characteristics of the betel leaf farmers correlated with their problem confrontation in betel leaf cultivation. However, the 12 selected salient features of the betel leaf farmers such as age, level of education, family size, farm size, betel leaf cultivation area, family annual income, experience in betel leaf cultivation, knowledge on betel leaf cultivation, media exposure, cosmopoliteness, social organizational participation and problems in betel leaf cultivation that might be greatly influences the problem confrontation of betel leaf farmers are presented below-

4.1.1 Age

The age of the betel leaf farmers have been varied from 21 to 70 years with a mean and standard deviation of 42.42 and 12.94 respectively. Considering the recorded age betel leaf farmers were classified into three categories namely ‘young’, ‘middle’ and ‘old’ aged. The distribution of the betel leaf farmers on accordance of their age are presented in Table 4.1.

Table 4.1 Distribution of the betel leaf farmers according to their age

Categories	Respondents'		Mean	Standard deviation
	Number	Percent		
Young aged (< 35 years)	29	29.59	42.42	12.94
Middle aged (35-50 years)	44	44.90		
Old aged (> 50 years)	25	25.51		
Total	98	100.00		

According to the data of Table 4.1 it was revealed that the middle aged betel leaf farmers comprised the highest proportion (44.90 percent) followed by young old aged category (29.59 percent) and the lowest proportion were made by the old aged category (25.51 percent). Data also indicates that the middle and young aged respondents constitute almost 75 percent of total respondents. The young and middle aged respondents were generally more involved in betel leaf cultivation than the older.

4.1.2 Level of education

The level of educational scores of the betel leaf farmers ranged from 0 to 14 with a mean and standard deviation of 5.28 and 5.27 respectively. Based on the educational scores, the respondents were classified into four categories such as 'illiterate' (0<), 'primary education' (1 to 5), 'secondary education' (6 to 10), above secondary (above 10). The distributions of the respondents according to their level of education are presented in Table 4.2.

Table 4.2 Distribution of the betel leaf farmers according to their level of education

Categories	Respondents'		Mean	Standard deviation
	Number	Percent		
Illiterate (0 <)	47	47.96	5.28	5.27
Primary education (1-5)	8	8.16		
Secondary education (6-10)	26	26.53		
Above secondary education (> 10)	17	17.35		
Total	98	100.00		

Table 4.2 shows that respondent under illiterate category constitute the highest proportion (47.96 percent) followed by secondary education (26.53 percent). On the other hand the lowest 8.16 percent in primary education level category followed by above secondary category (17.35 percent). Education broadens the horizon of outlook of betel leaf farmers and expands their capability to analyze any situation related to betel leaf production. An educated betel leaf farmers is likely to be more responsive to the modern facts, ideas, technology and information of betel leaf production. To adjust with the same, they would be progressive minded to adopt as well as involve with modern cultural, processing and marketing facilities of betel leaf.

4.1.3 Family Size

Family size of the respondent betel leaf farmers ranged from 2 to 12 with the mean and standard deviation of 4.91 and 1.78 respectively. According to family size the respondents were classified into three categories viz. 'small', 'medium' and 'large' family. The distribution of the respondents according to their family size is presented in Table 4.3.

Table 4.3 Distribution of the betel leaf farmers according to their family size

Categories	Respondents'		Mean	Standard deviation
	Number	Percent		
Small family (< 4)	47	47.96	4.91	1.78
Medium family (5-7)	41	41.84		
Large family (> 7)	10	10.20		
Total	98	100.00		

Data in Table 4.3 indicate that the small size family constitute the highest proportion (47.96 percent) followed by the medium size family (41.84 percent). Only 10.20 percent respondents had large family size. Such finding is quite normal as per the situation of Bangladesh. Table 4.3 also showed that average family size of the respondents was comparatively lower than that of national average of 5.40.

4.1.4 Farm size

The farm size of the respondent's betel leaf farmers ranged from 0.09 ha to 2.29 ha with a mean and standard deviation of 0.763 and 0.524 respectively. Based on their farm size, the respondents were classified into three categories following the categorization of DAE. These categories were marginal farm holder (below 0.2 ha), small farm holder (0.200 to <1.0 ha) and medium farm holder (1.00 ha to 3.0 ha). The distribution of the betel leaf farmers according to their farm size is presented in Table 4.4.

Table 4.4 Distribution of the betel leaf farmers according to their farm size

Categories	Respondents'		Mean	Standard deviation
	Number	Percent		
Marginal (< 0.2 ha)	10	10.20	0.763	0.524
Small (0.201-1.0 ha)	67	68.37		
Medium (> 1.00 ha)	21	21.43		
Total	98	100.00		

Table 4.4 indicates that the small farm holder constitute the highest proportion (68.37 percent) and the lowest 10.20 percent marginal farm holder followed by medium farm holder (21.43 percent). The findings of the study reveal that majority of the betel leaf farmers were small to medium sized farm holder. The average farm size (0.763 ha) was similar than that of national average of 0.78 ha of Bangladesh (BBS, 2013).

4.1.5 Betel leaf cultivation area

Betel leaf cultivation area of the betel leaf farmers ranged from 0.02 ha to 0.67 ha with a mean and standard deviation of 0.213 and 0.133 respectively. Based on the betel leaf cultivation area, the respondents were classified into three categories as small, medium and large betel leaf farm. The distribution of the betel leaf farmers according to their betel leaf cultivation area has been presented in Table 4.5.

Table 4.5 Distribution of the betel leaf farmers according to their betel leaf cultivation area

Categories	Respondents'		Mean	Standard deviation
	Number	Percent		
Small betel leaf farm (< 0.20 ha)	62	63.27	0.213	0.133
Medium betel leaf farm (0.20-0.40 ha)	30	30.61		
Large betel leaf farm (> 0.40 ha)	6	6.12		
Total	98	100.00		

Table 4.5 indicates that the small betel leaf farm constitutes the highest proportion (63.27 percent) followed by medium betel leaf farm (30.61 percent) and the lowest (6.12 percent) in large betel leaf farm. The findings reveal that majority of the betel leaf farmers have low to medium sized betel leaf cultivation farms.

4.1.6 Family annual income

Family annual income of the respondent betel leaf farmers ranged from 54 to 224 thousand taka with a mean and standard deviation of 106.17 and 34.06 respectively. On the basis of annual income, the betel leaf farmers were classified into three categories, viz. low, medium and high annual income. The distribution of the betel leaf farmers according to annual income are presented in Table 4.6.

Table 4.6 Distribution of the betel leaf farmers according to their family annual income

Categories	Respondents'		Mean	Standard deviation
	Number	Percent		
Low income (< 100)	49	50.00	106.17	34.06
Medium income (100-150)	39	39.80		
High income (> 150)	10	10.20		
Total	98	100.00		

Data revealed that the betel leaf farmers having low family annual income constitute the highest proportion (50.00 percent) followed by medium income (39.80 percent) and low income (10.20 percent). Overwhelming majority (90 percent) betel leaf farmers have low to medium level annual income.

4.1.7 Experience of betel leaf cultivation

Experience of betel leaf cultivation score of the respondent betel leaf farmers could range from 10 to 23 against the possible range of 6 to 24 with mean and standard deviation of 17.24 and 2.91 respectively. On the basis of experience of betel leaf cultivation scores, the respondents were classified into three categories namely, 'low, 'medium' and 'high' experience. The distribution of the respondents according to their experience of betel leaf cultivation is given in Table 4.7.

Table 4.7 Distribution of the betel leaf farmers according to their experience in betel leaf cultivation

Categories	Respondents'		Mean	Standard deviation
	Number	Percent		
Low experience (< 15)	19	19.39	17.24	2.91
Medium experience (15-20)	69	70.41		
High experience (> 20)	10	10.20		
Total	98	100.00		

Data of Table 4.7 reveals that majority (70.41 percent) of the respondents felt in medium experience category followed by 19.39 percent in low experience category and only 10.20 percent in high experience category. The findings of the present study reveal that around 90 percent of the respondent betel leaf farmers in the study area had low to medium experience of betel leaf cultivation.

4.1.8 Knowledge on betel leaf cultivation

Knowledge on betel leaf cultivation scores of the betel leaf farmers varied from 17 to 25 against the possible range of 0 to 28 with the mean and standard deviation of 21.72 and 1.94 respectively. On the basis of knowledge on betel leaf cultivation scores, the respondents were classified into three categories namely, 'low, 'medium' and 'high' knowledge. The distribution of the respondents according to their knowledge on betel leaf cultivation is given in Table 4.8.

Table 4.8 Distribution of the betel leaf farmers according to their knowledge on betel leaf cultivation

Categories	Respondents'		Mean	Standard deviation
	Number	Percent		
Low knowledge (< 19)	16	16.33	21.72	1.94
Medium knowledge (19-22)	61	62.24		
High knowledge (> 22)	21	21.43		
Total	98	100.00		

It was revealed that the majority (62.24 percent) of the betel leaf farmers fell in medium knowledge category followed by 21.43 percent in high knowledge category and only 16.33 percent in low knowledge category. The findings of the present study reveal that around 84 percent of the betel leaf farmers in the study area had medium to high knowledge on betel leaf cultivation.

4.1.9 Media exposure

Media exposure score of the respondent ranged from 17 to 33 against the possible range of 0 to 40 with a mean and standard deviation of 24.28 and 3.63, respectively. Based on the media exposure score, the respondents were classified into three categories. These categories were 'low', 'medium' and 'high' media exposure. The distribution of the betel leaf farmers according to their media exposure is presented in Table 4.10.

Table 4.9 Distribution of the betel leaf farmers according to their media exposure

Categories	Respondents'		Mean	Standard deviation
	Number	Percent		
Low media exposure (< 20)	9	9.18	24.28	3.63
Medium media exposure (20-28)	49	50.00		
High media exposure (> 28)	40	40.82		
Total	98	100.00		

Table 4.9 indicates that highest proportion (50.00 percent) of the respondents had medium media exposure compared to 40.82 percent had high media exposure and

the lowest proportion (9.18 percent) had low media exposure.

4.1.10 Cosmopoliteness

Cosmopoliteness score of the betel leaf farmers ranged from 10 to 19 against the possible range of 0 to 28 with a mean and standard deviation of 15.02 and 2.09 respectively. Based on their cosmopoliteness score, the respondents were classified into three categories. These categories were low, medium and high cosmopoliteness. The distribution of the betel leaf farmers according to their cosmopoliteness is presented in Table 4.10.

Table 4.10 Distribution of the betel leaf farmers according to their cosmopoliteness

Categories	Respondents'		Mean	Standard deviation
	Number	Percent		
Low cosmopoliteness (< 12)	14	14.29	15.02	2.09
Medium cosmopoliteness (12-16)	57	58.16		
High cosmopoliteness (> 16)	27	27.55		
Total	98	100.00		

Data presented in Table 4.10 data reveal that about 58.16 percent of the betel leaf farmers were medium cosmopoliteness groups, while 27.55 percent high cosmopoliteness and the lowest 14.29 percent were low cosmopoliteness group under the study.

4.1.11 Social organizational participation

Social organizational participation score of the betel leaf farmers ranged from 9 to 22 with a mean and standard deviation of 15.73 and 2.38 respectively. Based on their social organizational participation score, the betel leaf farmers were classified into three categories. These categories were low, medium and high participation. The distribution of the betel leaf farmers according to their social organizational participation is presented in Table 4.11.

Table 4.11 Distribution of the betel leaf farmers according to their social organizational participation

Categories	Respondents'		Mean	Standard deviation
	Number	Percent		
Low participation (< 15)	32	32.65	15.73	2.38
Medium participation (15-18)	51	52.04		
High participation (> 18)	15	15.31		
Total	98	100.00		

Data revealed that the highest proportion (52.04 percent) of the respondents had medium organizational participation, while 32.65 percent had low organizational participation and the lowest 15.31 percent had high organizational participation.

4.1.12 Problems in betel leaf cultivation

Problems in betel leaf cultivation score of the respondent ranged from 29 to 51 against the possible range of 0 to 60 with a mean and standard deviation of 42.19 and 4.21 respectively. Based on the problems in betel leaf cultivation score, the respondents were classified into three categories. These categories were 'low', 'medium' and 'high' problems. The distribution of the betel leaf farmers according to their problem in betel leaf cultivation is presented in Table 4.12.

Table 4.12 Distribution of the betel leaf farmers according to their problems in betel leaf cultivation

Categories	Respondents'		Mean	Standard deviation
	Number	Percent		
Low problems (< 38)	6	6.12	42.19	4.21
Medium problems (38-44)	28	28.57		
High problems (> 44)	64	65.31		
Total	98	100.00		

Table 4.12 indicates that highest proportion (65.31 percent) of the respondents had high problems followed by 28.57 percent in medium problem, whereas the lowest proportions (6.12 percent) had low problems.

4.2 Problem confrontation of betel leaf farmers

Problem confrontation of betel leaf farmers was the dependent variable of this study. Problem confrontation of the betel leaf farmers was measured by computing problems confrontation scores according to extent of implementing problems confrontation to cope with each of 12 selected items in betel leaf cultivation.

Problem confrontation of the betel leaf farmers range from 29 to 48 against the possible range of 12 to 26 with the mean and standard deviation of 38.31 and 4.88 respectively. On the basis of problem confrontation scores of betel leaf farmers scores, the respondents were classified into three categories namely, low, medium and ‘high problem confrontation. The distribution of the respondents according to problem confrontation by the betel leaf farmers under the study is given in Table 4.13.

Table 4.13 Distribution of the betel leaf farmers according to their problem confrontation

Categories	Respondents’		Mean	Standard deviation
	Number	Percent		
Low problem confrontation (< 35)	23	23.46	38.31	4.88
Medium problem confrontation (35-42)	55	56.12		
High problem confrontation (> 42)	20	20.42		
Total	98	100.00		

Table 4.12 indicates that among the respondents the highest 56.12 percent betel leaf farmers belongs to the group of medium problem confrontation and the lowest percentage 20.42 percent in high problem confrontation followed by low problem confrontation (23.46 percent) of the betel leaf farmers in betel leaf cultivation. Among the respondent most of the respondent betel leaf farmers confront their problem using their long experience and knowledge gathered from day to day practices in betel leaf cultivation.

4.2.1 Rank order of problem confrontation strategies applied by betel leaf farmers

To ascertain the best problem confrontation strategies Problem Confrontation Index (PCI) was computed. There were twelve problem confrontation strategies for coping with 12 selected items by the betel leaf farmers in betel leaf cultivation. The betel leaf farmers implement different extent of problem confrontation strategies against different problems. They are presented below in rank order. A Problem Confrontation Index (PCI) was computed for each problem confrontation strategies by using the formula:

Problem Confrontation Index (PCI) = $P_{VL}\times1 + P_L\times2 + P_M\times3 + P_G\times4 + P_{VG}\times5$

Where,

P_{VL} = Very low extent of problem confrontation

P_L = Low extent of problem confrontation

P_M = Medium extent of problem confrontation

P_G = Good extent of problem confrontation

P_{VG} = Very good extent of problem confrontation

Problem Confrontation Index (PCI) for each problem confrontation strategies could range from 98 to 490, where 98 indicating lowest extent and 490 indicating highest extent of problem confrontation. However, observed Problem Confrontation Index (PCI) ranged from 125 to 410.

Table 4.14 represents rank order of the twelve strategies of problem confrontation. As per Problem Confrontation Index (PCI) arrangement of auto rickshaw, van as transport facilities for marketing positioned the 1st, collection of quality betel vine from recognized sources (Pann boroj, market) in 2nd, self prepared compost is applied in betel leaf field in 3rd, cultivation cost was reduced by economic use of inputs in 4th, acquire knowledge through discussion with extension officer, local leaders, others betel leaf farmers in 5th, having training from experienced farmers

Table 4.14 Rank order of problem confrontation

Problem confrontation strategies	Problem Confrontation Index (PCI)	Rank
Arrangement of auto rickshaw, van as transport facilities for marketing	410	1
Collection of quality betel vine from recognized sources (Pann boroj, market)	353	2
Application of self prepared compost in betel leaf field	329	3
Reduced cultivation cost by economic use of inputs	258	4
Acquire knowledge through discussion with extension officer, local leaders, others betel leaf farmers	242	5
Having training from experienced farmers and hiring skilled labor	232	6
Fixing price though bargaining with commission agent	210	7
Frequent contact with extension staff at convenient time	198	8
Arrangement of loan from Banks, Samity and NGOs etc.	192	9
Taken prevention measures by making fence and roof to avoid fog, entrance of direct sunlight and wind to protect betel leaf from falling off	187	10
Taken effective control measures for leaf rot and stem rot diseases	138	11
Arrangement of interest free loan from relatives, family savings etc.	125	12

and also hired skilled labor in 6th, fixing price though bargaining with commission agent in 7th, frequent contact with extension staff at convenient time in 8th, arrangement of loan from Banks, Samity and NGOs etc. in 9th, prevention measures are taken by making fence and roof to avoid fog, entrance of direct sunlight and wind to protect betel leaf from falling off in 10th, leaf rot and stem rot diseases control measures are taken effectively in 11th and arrangement of interest free loan from relatives, family savings etc. in 12th.

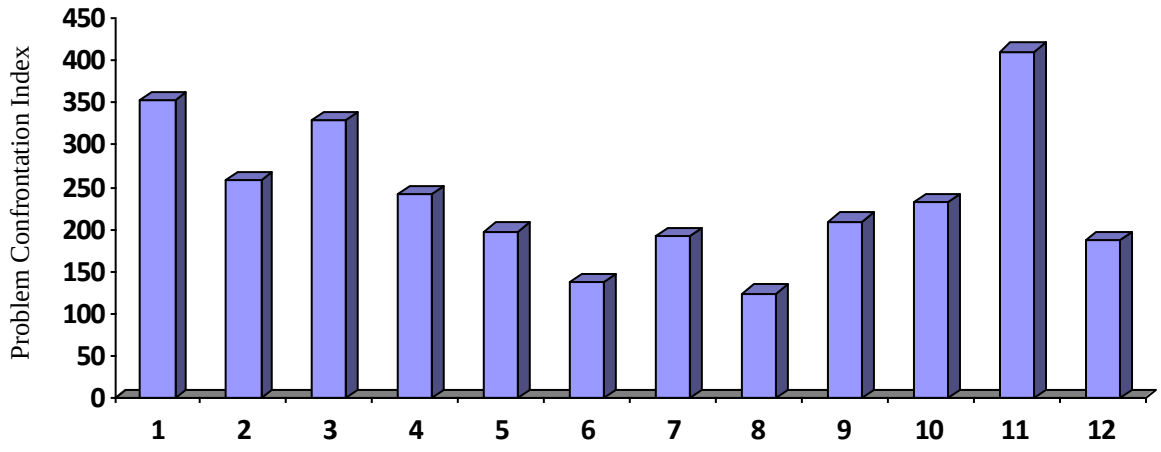

Figure 4.1. Graphical presentation of Problem Confrontation Index (PCI) of problem confrontation

Legend:

1: Collection of quality betel vine from recognized sources (Pann boroj, market)

2. Reduced cultivation cost by economic use of inputs

3: Application of self prepared compost in betel leaf field

4: Acquire knowledge through discussion with extension officer, local leaders, others betel leaf farmers

5: Frequent contact with extension staff at convenient time

6: Taken effective control measures for leaf rot and stem rot diseases

7: Arrangement of loan from Banks, Samity and NGOs etc.

8: Arrangement of interest free loan from relatives, family savings etc.

9: Fixing price though bargaining with commission agent

10: Having training from experienced farmers and hiring skilled labor

11: Arrangement of auto rickshaw, van as transport facilities for marketing

12: Taken prevention measures by making fence and roof to avoid fog, entrance of direct sunlight and wind to protect betel leaf from falling off

4.3 Relationship between selected characteristics of betel leaf farmers and their problem confrontation

Pearson Product Moment Correlation Co-efficient was computed in order to find out the extent of relationship between the dependent variable and independent variables. To reject or accept the null hypothesis at 0.05 and 0.01 level of probability was used. A statistically significant and non-significant relationship was observed when the computed value or "r" was greater or smaller than the tabulated value, respectively.

Table 4.15 Pearson's product moment co-efficient of correlation showing relationship between dependent and independent variables

N =98

Dependent variable	Independent variables	Tabulated value		Value of co-efficient of correlation
		0.05 level	0.01 level	
Problem Confrontation in Betel Leaf Cultivation by the Farmers of Natore District	Age	0.198	0.254	0.365**
	Level of education			0.240*
	Family size			-0.018^{NS}
	Farm size			0.095^{NS}
	Betel leaf cultivation area			0.195^{NS}
	Family annual income			0.184^{NS}
	Experience in betel leaf cultivation			0.825**
	Knowledge on betel leaf cultivation			0.794**
	Media exposure			0.683**
	Cosmopoliteness			0.697**
	Social organizational participation			0.401**
	Problems in betel leaf cultivation			-0.572**

**: Correlation is significant at the 0.01 level; *: Correlation is significant at the 0.05 level

NS: Not Significant

4.3.1 Age and problem confrontation of betel leaf farmers

The coefficient of correlation between age and problem confrontation of betel leaf farmers is presented in Table 4.15. The coefficient of correlation between the concerned variables was found 0.365. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study:

a. *The observed value between the concerned variables "r" (0.365) was found to be greater than the tabulated value (r = 0.254) with 96 degrees of freedom at 0.01 level of probability.*

b. *The null hypothesis could be rejected.*

c. *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*

d. *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that age had significant positive relationship with the problem confrontation of betel leaf farmers. This represents that age of the betel leaf farmers was an important factor in problem confrontation and with the increases of age problem confrontation of betel leaf farmers also increases.

4.3.2 Level of education and problem confrontation of betel leaf farmers

The coefficient of correlation between level of education and problem confrontation of betel leaf farmers is presented in Table 4.15. The coefficient of correlation between the concerned variables was found 0.240. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study:

a. *The observed value between the concerned variables "r" (0.240) was found to be greater than the tabulated value (r = 0.198) with 96 degrees of freedom at 0.05 level of probability.*

b. *The null hypothesis could be rejected.*

c. *The relationship between the concerned variables was statistically significant at 0.05 level of probability.*

d. *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that level of education had significant positive relationships with the problem confrontation of betel leaf farmers. This represents that level of education of the betel leaf farmers was an important factor in problem confrontation and with the increases of level of education problem confrontation of betel leaf farmers also increases.

4.3.3 Family size and problem confrontation of betel leaf farmers

The coefficient of correlation between family size and problem confrontation of betel leaf farmers is presented in Table 4.15. The coefficient of correlation between the concerned variables was found -0.018. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study:

a. *The observed value between the concerned variables "r" (-0.018) was found to be smaller than the tabulated value (r = 0.198) with 96 degrees of freedom at 0.05 level of probability.*

b. *The null hypothesis could not be rejected.*

c. *The relationship between the concerned variables was statistically non significant at 0.05 level of probability.*

d. *The relationship showed a negative trend between the concerned variables.*

Based on the above findings it was concluded that family size had non significant negative relationships with the problem confrontation of betel leaf farmers. This represents that family size of the betel leaf farmers was not an important factor in

problem confrontation and with the increases of family size problem confrontation of betel leaf farmers also decreases.

4.3.4 Farm size and problem confrontation of betel leaf farmers

The coefficient of correlation between farm size and problem confrontation of betel leaf farmers is presented in Table 4.15. The coefficient of correlation between the concerned variables was found 0.095. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study:

a. *The observed value between the concerned variables "r" (0.095) was found to be smaller than the tabulated value (r = 0.198) with 96 degrees of freedom at 0.05 level of probability.*

b. *The null hypothesis could not be rejected.*

c. *The relationship between the concerned variables was statistically non significant at 0.05 level of probability.*

d. *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that farm size had non significant positive relationships with the problem confrontation of betel leaf farmers. This represents that farm size of the betel leaf farmers was not an important factor in problem confrontation and with the increases of farm size problem confrontation of betel leaf farmers also increases.

4.3.5 Betel leaf cultivation area and problem confrontation of betel leaf farmers

The coefficient of correlation between betel leaf cultivation area and problem confrontation of betel leaf farmers is presented in Table 4.15. The coefficient of correlation between the concerned variables was found 0.195. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study:

a. *The observed value between the concerned variables "r" (0.195) was found to be smaller than the tabulated value (r = 0.198) with 96 degrees of freedom at 0.05 level of probability.*

b. *The null hypothesis not could be rejected.*

c. *The relationship between the concerned variables was statistically non significant at 0.05 level of probability.*

d. *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that betel leaf cultivation area had non significant positive relationships with the problem confrontation of betel leaf farmers. This represents that betel leaf cultivation area of the betel leaf farmers was not an important factor in problem confrontation and with the increases of betel leaf cultivation area problem confrontation of betel leaf farmers also increases.

4.3.6 Family annual income and problem confrontation of betel leaf farmers

The coefficient of correlation between family annual income and problem confrontation of betel leaf farmers is presented in Table 4.15. The coefficient of correlation between the concerned variables was found 0.184. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study:

a. *The observed value between the concerned variables "r" (0.184) was found to be smaller than the tabulated value (r = 0.198) with 96 degrees of freedom at 0.05 level of probability.*

b. *The null hypothesis not could be rejected.*

c. *The relationship between the concerned variables was statistically non significant at 0.05 level of probability.*

d. *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that family annual income had non significant positive relationships with the problem confrontation of betel leaf farmers. This represents that family annual income of the betel leaf farmers was not an important factor in problem confrontation and with the increases of family annual income problem confrontation of betel leaf farmers also increases.

4.3.7 Experience in betel leaf cultivation and problem confrontation of betel leaf farmers

The coefficient of correlation between experience in betel leaf cultivation and problem confrontation of betel leaf farmers is presented in Table 4.15. The coefficient of correlation between the concerned variables was found 0.825. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study:

a. *The observed value between the concerned variables "r" (0.825) was found to be greater than the tabulated value (r = 0.254) with 96 degrees of freedom at 0.01 level of probability.*

b. *The null hypothesis could be rejected.*

c. *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*

d. *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that experience in betel leaf cultivation had significant positive relationships with the problem confrontation of betel leaf farmers. This represents that experience in betel leaf cultivation of the betel leaf farmers was an important factor in problem confrontation and with the increases of experience in betel leaf cultivation problem confrontation of betel leaf farmers also increases.

4.3.8 Knowledge on betel leaf cultivation and problem confrontation of betel leaf farmers

The coefficient of correlation between knowledge on betel leaf cultivation and problem confrontation of betel leaf farmers is presented in Table 4.15. The coefficient of correlation between the concerned variables was found 0.794. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study:

a. *The observed value between the concerned variables "r" (0.794) was found to be greater than the tabulated value (r = 0.254) with 96 degrees of freedom at 0.01 level of probability.*

b. *The null hypothesis could be rejected.*

c. *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*

d. *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that knowledge on betel leaf cultivation had significant positive relationships with the problem confrontation of betel leaf farmers. This represents that knowledge on betel leaf cultivation of the betel leaf farmers was an important factor in problem confrontation and with the increases of knowledge on betel leaf cultivation problem confrontation of betel leaf farmers also increases.

4.3.9 Media exposure and problem confrontation of betel leaf farmers

The coefficient of correlation between media exposure and problem confrontation of betel leaf farmers is presented in Table 4.15. The coefficient of correlation between the concerned variables was found 0.683. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study:

a. *The observed value between the concerned variables "r" (0.683) was found to be greater than the tabulated value (r = 0.254) with 96 degrees of freedom at 0.01 level of probability.*

b. *The null hypothesis could be rejected.*

c. *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*

d. *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that media exposure had significant positive relationships with the problem confrontation of betel leaf farmers. This represents that media exposure of the betel leaf farmers was an important factor in problem confrontation and with the increases of media exposure problem confrontation of betel leaf farmers also increases.

4.3.10 Cosmopoliteness and problem confrontation of betel leaf farmers

The coefficient of correlation between cosmopoliteness and problem confrontation of betel leaf farmers is presented in Table 4.15. The coefficient of correlation between the concerned variables was found 0.697. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study:

a. *The observed value between the concerned variables "r" (0.697) was found to be greater than the tabulated value (r = 0.254) with 96 degrees of freedom at 0.01 level of probability.*

b. *The null hypothesis could be rejected.*

c. *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*

d. *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that cosmopoliteness had significant positive relationships with the problem confrontation of betel leaf farmers. This represents that cosmopoliteness of the betel leaf farmers was an important factor in problem confrontation and with the increases of cosmopoliteness problem confrontation of betel leaf farmers also increases.

4.3.11 Social organization participation and problem confrontation of betel leaf farmers

The coefficient of correlation between social organization participation and problem confrontation of betel leaf farmers is presented in Table 4.15. The coefficient of correlation between the concerned variables was found 0.401. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study:

a. *The observed value between the concerned variables "r" (0.401) was found to be greater than the tabulated value (r = 0.254) with 96 degrees of freedom at 0.01 level of probability.*

b. *The null hypothesis could be rejected.*

c. *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*

d. *The relationship showed a positive trend between the concerned variables.*

Based on the above findings it was concluded that social organization participation had significant positive relationships with the problem confrontation of betel leaf farmers. This represents that social organization participation of the betel leaf farmers was an important factor in problem confrontation and with the increases of social organization participation problem confrontation of betel leaf farmers also increases.

4.3.12 Problems in betel leaf cultivation and problem confrontation of betel leaf farmers

The coefficient of correlation between problems in betel leaf cultivation and problem confrontation of betel leaf farmers is presented in Table 4.15. The coefficient of correlation between the concerned variables was found -0.572. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study:

a. *The observed value between the concerned variables "r" (-0.572) was found to be greater than the tabulated value (r = 0.254) with 96 degrees of freedom at 0.01 level of probability.*

b. *The null hypothesis could be rejected.*

c. *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*

d. *The relationship showed a negative trend between the concerned variables.*

Based on the above findings it was concluded that problems in betel leaf cultivation had significant negative relationship with the problem confrontation of betel leaf farmers. This represents that problems in betel leaf cultivation of the betel leaf farmers was an important factor in problem confrontation but with the increases of problems in betel leaf cultivation problem confrontation of betel leaf farmers also decreases.

Pearson Product Moment Correlation Co-efficient revealed that age, level of education, experience in betel leaf cultivation, knowledge on betel leaf cultivation, media exposure, cosmopoliteness, social organizational participation had significant positive relationships with problem confrontation of betel leaf farmers but farm size, betel leaf cultivation area, family annual income had non significant positive relationships, while problems in betel leaf cultivation had significant negative relationship with problem confrontation of betel leaf farmers and family size had non significant negative relationship under the present study.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The study was conducted in the Gurudaspur and Baraigram upazilas under Natore district. An update list of 978 farmers who were related to betel leaf cultivation from the selected upazilas was prepared with the help of Upazila Agricultural Officer of these localities. Around 10% of the populations were randomly selected as the sample of the study by using random sampling method. Thus, 98 betel leaf farmers constituted the sample of the study. A well structured interview schedule was developed based on objectives of the study for collecting information. The researcher himself collected data through personal contact. The independent variables were: age, level of education, family size, farm size, betel leaf cultivation area, family annual income, experience in betel leaf cultivation, knowledge on betel leaf cultivation, media exposure, cosmopoliteness, social organizational participation and problems in betel leaf cultivation. The dependent variable of this study was the Problem Confrontation of Betel Leaf (Paan) Farmers in Natore District. Data collection was started in 12 August, 2014 and completed in 20 September, 2014. Various statistical measures such as frequency counts, percentage distribution, average, and standard deviation were used in describing data. Co-efficient of correlation test was used to explore relationship between the concerned variables. The major findings of the study are summarized below:

5.1 Major Findings

5.1.1 Selected characteristics of the betel leaf farmers

Age: The middle aged betel leaf farmers comprised the highest proportion (44.90 percent) and the lowest proportion was made by the old aged category (25.51 percent).

Level of education: Secondary education category constitutes the highest proportion (26.53 percent) and the lowest 8.16 percent in primary education level category.

Family Size: The small size family constitutes the highest proportion (47.96 percent) and only 10.20 percent respondents had large family size.

Farm size: The small farm holder constitutes the highest proportion 68.37 percent and the lowest 10.20 percent in marginal farm holder.

Betel leaf cultivation area: The low cultivable land area constitutes the highest proportion 63.27 percent and the lowest 6.12 percent in high cultivable area category in betel leaf cultivation.

Family annual income: The betel leaf farmers having low family annual income constitute the highest proportion (50.00 percent) and low income (10.20 percent) is the lowest family annual income.

Experience of betel leaf cultivation: The majority (70.41 percent) of the respondents felt in medium experience category the lowest 10.20 percent in high experience category.

Knowledge on betel leaf cultivation: The majority (62.24 percent) of the respondents felt in medium knowledge category and the lowest 16.33 percent in low knowledge category.

Media exposure: The betel leaf farmers have medium media exposure constitute the highest proportion (50.00 percent), whereas the lowest proportion (9.18 percent) has low media exposure.

Cosmopoliteness: The highest proportion (58.16 percent) of the respondents had medium level cosmopoliteness, while the lowest 14.29 percent had low level cosmopoliteness.

Social organizational participation: The highest (52.04 percent) of the respondents had medium organizational participation, while the lowest 15.31 percent had high organizational participation.

Problems in betel leaf cultivation: Betel leaf farmers having high problems constitute the highest proportion (65.31 percent), whereas the lowest proportion (6.12 percent) have low problems.

5.1.2 Problem confrontation of betel leaf farmers

Among the respondents, the highest 56.12 percent betel leaf farmers belongs to the group of medium problem confrontation and the lowest percentage 20.42 percent in high problem confrontation.

5.1.3 Relationship between selected characteristics of betel leaf farmers and their problem confrontation

Pearson Product Moment Correlation Co-efficient between dependent and independent variable revealed that age, level of education, experience in betel leaf cultivation, knowledge on betel leaf cultivation, media exposure, cosmopoliteness, social organizational participation had significant positive relationships with problem confrontation of betel leaf farmers. Farm size, betel leaf cultivation area, family annual income had non significant positive relationships with problem confrontation of betel leaf farmers. On the other hand, problems in betel leaf cultivation had significant negative relationship with problem confrontation of betel leaf farmers and family size had non significant negative relationship under the present study.

5.2 Conclusions

On the basis of findings of the study, the logical interpretation of the meaning and other relevant facts enabled the researcher to draw the following conclusions.

1. The findings indicate that the highest problem (76.54) of the betel leaf farmers had high to medium problem confrontation. That means three fourth of betel leaf farmers efficiently can confront the problem of betel leaf production by using their own experiences and knowledge.

2. Age of the betel leaf farmers, education, experience in betel leaf cultivation, knowledge, cosmopoliteness, media exposure, social organizational participation had significant positive relationships with problem confrontation of betel leaf farmers. This means that these variables had influence over betel leaf problem confrontation. On the other hand farm size, betel leaf cultivation area, family annual income had non significant positive relationships with

problem confrontation of betel leaf farmers. It reveals that, these variables had no influence over betel leaf problem confrontation.

3. From the rank order conclusion can be drown that betel leaf farmers could confront poor transport facilities, lack of quality betel vine, shortage of organic manure successfully. Poor transport system was overcome by arrangement of auto rickshaw & van, lack of quality betel vine was overcome by collection of betel vine from recognized sources, shortage of organic manure was overcome by application of self prepared compost.

4. 5.3 Recommendations

5.3.1 Recommendations for policy implications

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

1. Among the respondents, about 76.54 percent respondent betel leaf farmers belongs to the group of highest and medium problem confrontation. So in order to increase more problem confrontation of betel leaf farmers, DAE and other development organization may arrange training for the betel leaf farmers.
2. About 70 percent betel leaf farmers have in medium experience group in betel leaf cultivation. Different government and non-government organizations necessary to undertake different initiative for increasing experience on betel leaf cultivation.

4 About 62 percent betel leaf farmers have in medium knowledge group in betel leaf cultivation. Different government and non-government organizations necessary to undertake different initiative for increasing knowledge on betel leaf cultivation.

5. About 52 percent betel leaf farmers have in medium level social organizational participation. Different government and non-government organizations

necessary to undertake different initiative for increasing organizational participation.

5.3.2 Recommendations for further study

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

1. Other factors might have influence the problem confrontation in betel leaf farmers, which need to be identified through further study.
2. This study was conducted in Natore district. Similar studies are required to be conducted in other areas of Bangladesh where similar environmental, socio-economic and physical conditions exist to compare the findings.
3. The study investigated the direct and indirect effects of certain variables. Further studies should be conducted to explore the direct and indirect effects of all the variables under investigation.

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APPENDIX

Appendix 1. An interview schedule for the study

Department of Agricultural Extension & Information System

Sher-e-Bangla Agricultural University

Dhaka-1207

An Interview Schedule for a Research Study Entitled:

PROBLEM CONFRONTATION IN BETEL LEAF CULTIVATION BY THE FARMERS OF NATORE DISTRICT

Serial No……

Name of the respondent: ……..

Village……. Union…….

Upazilla…….. District……..

(Please answer the following questions /put tick wherever necessary)

1. Age

How old are you? .....years

2. **Education**:

Please mention your educational status

(a) I cannot read or write……

(b) I can sign only…….

(c) I studied up to class……..

3. **Family size**:

How many members are there in your family? .....

4. **Farm size**:
Please give a statement of your land according to use.

Sl.No.	Type of land use	Local unit	Hectare
(a)	Area under homestead		
(b)	Area under own cultivation		
(c)	Area given to others on share cropping		
(d)	Area taken from others on share cropping		
(e)	Area taken from others on lease		
(f)	Fellow land		
	Total farm size		

5. Betel leaf cultivation area:

Please mention your betel leaf cultivation area……hectare.

6. **Annual income**:

Please mention your annual income (TK) with sources (last year)

Sl. No.	Sources of income	Area (ha.)	Amount of production(mound.)	Total price (TK)
(a)	Betel leaf cultivation			
(b)	Rice			
(C)	Wheat			
(d)	Sugarcane			
(e)	Pulse			
(f)	Vegetables			
(g)	Fruits			
(h)	Livestock			
(i)	Poultry			
(k)	Fisheries			
(l)	Business			
(m)	Service			
(n)	Labor wage			
(o)	Other sources (if any)			
	Total			

7. Experience in betel leaf cultivation:

Please mention your experience in betel leaf cultivation (in years).

Sl. No.	Field of experience	Extent of experience			
		High (4)	Good (3)	Medium (2)	Low (1)
1	Vine selection				
2	Intercultural operations				
3	Disease control				
4	Harvest				
5	Betel leaf grading				
6	Marketing				

(Assessment to be made through discussion)

8. Knowledge on Betel leaf cultivation:

Please answer the following questions in connection with betel leaf cultivation.

Sl. No.	Questions	Total marks	Marks obtained
1	Mention the suitable time for betel leaf cultivation.	2	
2	What are the doses of fertilizers applied?	2	
3	When manure is needed in betel leaf cultivation?	2	
4	Mention irrigation time in betel leaf cultivation?	2	
5	How many numbers of irrigation is necessary for betel leaf cultivation?	2	
6	How many numbers of tillage is needed in betel leaf cultivation?	2	
7	Mention the items of intercultural operations those are practiced in betel leaf cultivation?	2	
8	Name two varieties of betel leaf.	2	
9	Mention two usage of betel leaf.	2	
10	Mention two diseases of betel leaf.	2	
11	Which types of betel vines are used in cultivation?	2	
12	Name one control measure of leaf rot and stem rot disease in betel leaf cultivation.	2	
13	How betel leaf is harvested?	2	
14	What operations are taken before marketing betel leaf?	2	
	Total	28	

9. **Media exposureof betel leaf farmers:**

Please indicate the extent of your exposure with the following information media.

Sl. No.	Media/Sources	Extent of exposure				
		Regularly(4)	Often (3)	Occasionally (2)	Rarely(1)	Not at all (0)
1	Other betel leaffarmers					
2	Neighbors					
3	Commission agent					
4	Dealers(fertilizers, pesticide)					
5	Extension officer					
6	Group discussion					
7	Result demonstration					
8	Newspaper					
9	Radio					
10	Television					

10. **Cosmopoliteness**:

Please indicate the extent of your visit outside society.

Sl. No.	Place of visit	Extent of visit				
		Regularly (4)	Frequently (3)	Occasionally (2)	Rarely (1)	Not at all (0)
1	Visit pan boroj of own union.					
2	Participate in agriculture fair organised in own upazilla.					
3	Visit pan boroj of own Upazilla.					
4	Visit pan market.					
5	Visit own District.					
6	Visit others District.					
7	Visit captal city.					

11. Social organizational participation by betel leaf farmers:

Please mention your nature of participation in the following social organization.

Sl. No.	Name of the organization	Nature of participation			
		As executive officer (3)	As executive member (2)	As officer (1)	No participation (0)
1	Union Council				
2	Youth Club				
3	Krishak Samabay samity				
4	School Committee				
5	Madrasha Committee				
6	Mosque /Mondir/Girza Committee				
7	NGO samity				
8	Betel leaf farmers club				

12. **Problems in betel leaf cultivation**:

Please mention theextent of problems in betel leaf cultivation.

Sl. No.	Problems	Extent of problems				
		Very high (5)	High (4)	Medium (3)	Low (2)	Very low (1)
1	Lack of quality betel leaf vine .					
2	High cultivation cost.					
3	Shortage of organic manure for betel leaf cultivation.					
4	Lack of knowledge on balanced fertilizer for betel leaf cultivation.					
5	Lack of contact with extension staff.					
6	Leaf rot and stem rot diseases of betel leaves.					
7	Lack of capital.					
8	High rate of interest.					
9	Low market price.					
10	Lack of skilled labor.					
11	Poor transport facilities.					
12	Fall off betel leaves during winter season.					

13. Problems confronted by betel leaf farmers:

Please mention the extent of problem confrontation in betel leaf cultivation.

Sl. No.	Problem confrontation	Extent of problem confrontation strategy				
		Very good (5)	Good (4)	Medium (3)	Low (2)	Very low (1)
1	Collection ofquality betel vine from recognised sources (Pann boroj, market).					
2	Reduced cultivation cost by economic use of inputs.					
3	Application of self prepared compost in betel leaf field.					
4	Acquire knowledge through discussion with extension officer, local leaders, others betel leaf farmers.					
5	Frequent contact with extension staff at convenient time.					
6	Taken effective control measures for leaf rot and stem rot diseases.					
7	Arrangement of loan from Banks, Samity and NGOs etc.					
8	Arrangement of interest free loan from relatives, family savings etc.					
9	Fixing price though bargaining with commission agent.					
10	Having training from experienced farmers and hiring skilled labor.					
11	Arrangement of auto rickshaw, vans transport facilities for marketing.					
12	Taken prevention measures by making fence and roof to avoid fog, entrance of direct sunlight and wind to protect betel leaf from falling off.					

Thank you for your kind co-operation in data collection.

Date……

……

(Signature of the interviewer)

Appendix II. Correlation Matrix

Characters	A	B	C	D	E	F	G	H	I	J	K	L	M
A	1.00												
B	-0.422**	1.00											
C	0.177	-0.122	1.00										
D	0.121	-0.038	.0284**	1.00									
E	0.013	0.106	0.034	0.305**	1.00								
F	-0.055	0.327**	0.105	0.784**	0.350**	1.00							
G	0.280**	0.247*	-0.111	-0.099	0.184	0.047	1.00						
H	0.288**	0.183	-0.124	-0.048	0.150	0.050	0.833**	1.00					
I	0.173	0.146	-0.132	0.011	0.125	0.124	0.698**	0.792**	1.00				
J	0.231*	0.100	-0.108	0.047	0.212*	0.053	0.726**	0.691**	0.706**	1.00			
K	0.201*	0.040	-0.040	0.043	0.062	0.055	0.327**	0.398**	0.479**	0.331**	1.00		
L	-0.108	-0.379**	0.100	-0.032	-0.198	-0.219*	-0.620**	-0.555**	-0.449**	-0.426**	-0.321**	1.00	
M	0.365**	0.240*	-00.018	0.095	0.195	0.184	0.825**	0.794**	0.683**	0.697**	0.401**	-0.572**	1.00

A: Age B: Level of education C: Family size D: Farm size

E: Betel leaf cultivation area F: Family annual income G: Experience in betel leaf cultivation H: Knowledge on betel leaf cultivation

I: Media exposure J: Cosmopoliteness K: Social organizational participation L: Problems in betel leaf cultivation

M: Problem confrontation in betel leaf cultivation by the farmers