

**PROSPECTS AND PROBLEM CONFRONTATION OF DYKE
VEGETABLE PRODUCTION IN GHERS OF SOUTH-WESTERN
COASTAL REGION OF BANGLADESH**



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**AGROTECHNOLOGY DISCIPLINE
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JUNE, 2018

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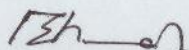
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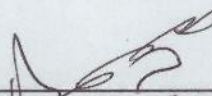
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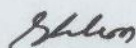
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JUNE, 2018

DEDICATED TO



MY BELOVED PARENTS

ABSTRACT

The main purpose of the study was to identify the prospects of Dyke Vegetable Production (DVP) in gher and to determine the problem confrontation of DVP. Data were collected from randomly selected 84 respondents in five selected villages named Kahalpur at Atjuri union, Joydihi, Munijela and Shawnapur at Kotalia union and Charkulia at Kulia union of Mollarhat upazila under Bagerhat district through interview method by the researcher herself using an interview schedule during the period from February to April 2018. Data were collected on Dyke area, Annual yield and income of DVP, Irrigation facilitation, family nutrition, food security, and Women involvement in DVP to determine the prospects of DVP on gher. Besides, data were collected on 13 selected characteristics of the DVP and the problems confronted by them. A number of 30 problems were identified as confronted by Dyke vegetables growers with different extent of severity. The most severe problem in Dyke vegetable farming in the study area was lack of technical knowledge for identification of Diseases while Unavailability of fertilizer in season was the least severe problem. The other major problems were lack of technical knowledge for identification of Insects, high percentage of insect attack, fertilizer enhance insect attack, rats attack. From respondent's consideration, most of the respondents belonged to medium problem confrontation. Among 13 selected characteristics of the respondent's only annual family income showed a significant positive relationship and extension contact showed a negative significant relationship with the problem confrontation.

Key Words: Dyke vegetable production, Prospects, Problem confrontation.

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ACRONYMS

NO	: Number
NS	: Non Significant
RO	: Rank Order
Sd	: Standard Deviation
DVP	: Dyke Vegetable Production
TK	: Taka

CHAPTER I

INTRODUCTION

1.1 Background of the Study

The coastal region covers almost 29,000 km² or about 20% of the country and more than 30% of the cultivable lands of the country. About 53% of the coastal areas are affected by salinity. Agricultural land use in these areas is very poor, which is much lower than country's average cropping intensity (Rahman, 2012). The region suffers from a range of problems, the most notable of which is soil and water salinity. The topsoil of nearly 223,000 ha of coastal arable land (27% of total cultivable land in the region) has been affected by various degrees of salinity during 1973-2009 due to decreasing freshwater flows of upstream rivers, an erratic rainfall pattern, the rise of brackish-water shrimp culture, tidal flooding, and capillary rise of dissolved salt (Kabir *et al.*, 2015).

Shrimp farming has contributed significantly to the national economy through foreign exchange earnings and generating income, employment, and food for coastal dwellers. However, there have been severe environmental impacts in the form of sedimentation, salinization, pollution, disease outbreaks, and loss of biodiversity (Kabir *et al.*, 2015). This was mainly because of poorly planned and unscientific practices. Shrimp farming involved the introduction of exotic species and pathogens, and the ponds (gher) regularly discharged polluted water and sludge containing particulate matter, unused fish feed, fertilizer and other chemicals, microorganisms, and faeces (Kabir *et al.*, 2015; Lin *et al.*, 2011). Consequently, the land and water resources of the coastal ecosystem were being degraded, resulting in decreased production of rice, vegetables and other crops (Rahman, 2011), livestock, and freshwater species, exacerbating food insecurity and livelihood vulnerability (Kabir *et al.*, 2015).

Cultivation of crops is almost absent in the South-western coastal region of Bangladesh, where Shrimp farming has been dominant since the mid-eighties. Salinity intrusion into agricultural land is increasing because of sea level rise due to climate change. Thus the practice of agriculture is being tremendously hindered in the coastal areas except for shrimp farming. The introduction of high value cropping on the dyke of Ghers will be an important intervention, although it was practiced a while back. Furthermore, the increasing homestead area and dyke area can be brought under vegetable cultivation.

Gher based integrated farming with low investment is economically sound, ecologically feasible and socially acceptable. Compared with the simple technology of extensive farming and expansive higher technology of intensive farming, integrated farming is a viable and intermediate option for rural entrepreneurs giving relatively high yield with fairly low input cost. Dyke Vegetable Production (DVP) is an indigenous knowledge based practice which is environment friendly. The farmers in area are following this practice as an alternative for their food security.

The production system adopted during Green Revolution has been explorative and the natural resources like soil and water were subjected to exploitation, as a result sustainability of agricultural production system has been jeopardized. This suggests the integration of land-based enterprises viz. dairy, fishery, poultry, duckery, apairy, field and horticultural crops within the farm, with the objective of generating adequate income and the employment of the small and marginal farmers and thereby improves their livelihoods. Integrated farming is a multi-commodity farming system which can be defined as an innovation in which two or more commodities are farmed together on a common infrastructural base with the objective to optimize upon use the operational cost. To this end, when a commodity is farmed in combination with fish it is termed as integrated farming or fish based integrated farming. In integrated fish farming, one or several farm commodities are integrated with fish culture

grain production led to adverse effect on the hectare age and production of vegetable. As a result the people of Bangladesh are suffering from severe malnutrition.

The government of Bangladesh has given emphasis on vegetable- production in the year round to meet the nutritional and caloric need for increasing employment opportunities and income of farmers.

It is necessary to involve farmers in production, planning and ascertain problem with regard to Dyke vegetables production to make Dyke vegetable cultivation profitable.

Find out the way of increasing production of vegetables by identifying main problems of Dyke vegetable cultivation to identification of the present condition of malnutrition of the people, if there exist any change of vegetable cropping pattern due to climate change and shrimp farming, farmer benefited or not from such kind of change etc. are the main justifications of the study.

1.5 Scope of the study

The study makes attempt to have an understanding of prospects of Dyke vegetable cultivation and problems faced by the farmers in Dyke vegetable cultivation and explore its relationship with their selected characteristics.

The findings of this study will be particularly applicable to the farmers of the respective study area. The findings of the study will also help the farmers of the areas similar to the study area to cope with climate change and ensure food security and supply of nutrition and enhanced in rural livelihood.

However, the findings will act as a guideline for the policy makers and extension planners to make policies and strategies for better utilization of Gher. The findings of the study will provide a modern technology on dyke management through utilizing locally available natural

resources for the farmers. Moreover, the findings of the study will provide information to the farmers who want to practice Dyke vegetable cultivation.

1.6 Statement of hypothesis

In order to guide relevant data, correlation, analysis and interpretation of data, a set of hypothesis was formulated for empirical testing. As defined by Goode and Halt (1952) “a hypothesis is a proposition, which can be put to a test to determine its validity”.

In studying relationship among variables, the following null hypotheses were developed to explore the nature of relationship between the dependent and independent variables.

“There are no relationship between the selected characteristics of farmers and their problem confrontation in Dyke vegetable cultivation in gher of South-western costal region of Bangladesh”. The selected characteristics are: age, education, farming experience, experience in fishing, experience in Dyke vegetable cultivation, family size, farm size, and annual income, cosmopoliteness, extension media contact and Dyke area.

1.7 Assumptions of the Study

“An assumption is the supposition that an apparent fact or principle is true in the light the available evidence” (Goode and Hatt, 1952). During conducting the researcher, the following assumptions were kept in mind.

1. The respondents were qualified to satisfy the queries designed by the researcher in the questionnaire.
2. The information furnished by the respondents was reliable and valid.
3. Views and opinions furnished by the respondents included in the sample were the representative views and opinions of the population of farmers in the study area.

1.8 Limitations of the Study

The following limitations were observed in conducting the present study:

1. The study was confined only to Atjuri, Kulia and Kodalia union under Mollarhat upazila of Bagerhat district.
2. Sample size of the study was limited.
3. The researchers were dependent on the data furnished by the selected respondents during their interview.
4. Major information, facts and figures supplied by the respondents were applicable to the situations prevailing in the locality during the year, 2017-2018.

1.9 Definition of Related Terms

The terms which have been frequently used throughout the research work are defined and interpreted below:

Age:

Age of a respondent was defined as the span of her life and was operationally measured by the number of years from her birth to the time of interview.

Education:

Education referred to the development of desirable knowledge, skill and attitude in the individual through reading, writing, and other related activities. It is measured in terms of schooling of individual respondent.

Experience in Dyke vegetable farming:

It refers time period of involvement of respondent with Dyke vegetable farming.

Family Size:

Family size of household was defined as the number of individuals in the family including herself, her husband, children and other dependent members who live and eat together.

Farm Size:

It referred to the area of land owned by a respondent on which farming activities are carried out. A respondent was considered to have full benefit from cultivated area either owned by him/her or obtained on share cropping system. The right of respondent on the land taken on lease or mortgage from others was regarded as ownership in estimating the farm size.

Family Income:

Family income was defined as the total earning of the respondent and the members of her family from agriculture and other sources (services, business, labor etc.) during a year.

Organizational participation:

It was considered to be an active process, meaning that the person or group in question took initiatives toward achieving something. Participation here meant to be involved in different affairs of Dyke vegetable cultivation by respondent.

Cosmopoliteness:

It refers to the frequency of movement of respondent to a distant place from his/her own village.

Extension Contact:

The term extension contact refers to an individual access to or contact to the communication media and sources or any extension teaching methods being used for dispersion of new technologies among respondents.

Area under Dyke vegetable cultivation:

It refers to the Dyke area in gher possession of a farmer on which are cultivated vegetables during the collection of data for this study.

CHAPTER II

REVIEW OF LITERATURE

The aim of this chapter is to show the reader that the author have read, and have a good grasp of the main published work concerning a particular topic or question in that field. In the latter cases in particular, the review will be guided by the research objective or by the issue or thesis that are arguing and will provide the framework for further work.

This chapter deals with literature having relevance with the present study. The literature has been presented in four sections. The first one deals with study related to problem faced by the farmers in Dyke vegetables production, second section deals with the relationship of selected characteristics of respondents with their faced problems and third section deals with the rest on is prospects of Dyke vegetable cultivation. Finally last section of this chapter deals with the conceptual framework of the study.

2.1 Studies on problems confronted by farmers in Dyke vegetable production

The literature related to the study is not available. However vegetables related literature are discussed below.

The study was conducted by Waliuzzaman (2008) in two villages of Horogram union under Paba upazila of Rajshahi district to identify the constraints of the farmers in commercial vegetable cultivation. After completing the study, he reported 25 constraints that were faced by the farmers in the study area. Among the identified constraints non-availability of storage facilities ranked first followed by non-availability of training on vegetable cultivation.

Pramanik (2001) made an extensive study on 24 problems of farm youth, at the villages related to different problems of crop cultivation in Mymensingh. Out of the problem the top 4 problems in rank order were local NGO take high rate of interest against a loan, lack of

agricultural machinery and tools, lack of cash and financial inability to arrange improved seeds, fertilizers and irrigation.

Alam *et al.* (2000) conducted a survey on jute crop in seven district of Bangladesh to find out the state of art in jute cultivation and found that scarcity of quality seeds; high labor wage and low market price of fiber were the major constraints of jute production.

Faroque (1997) found that female rural youth in Bhaluka (Mymensingh) lacked cash for buying seeds, seedlings and deprived of necessary knowledge in improved vegetable cultivation. He further added that the majority of the female rural youth faced very high (54%) problems.

Rahman (1995) in his study, identified farmers faced problems in cotton cultivation. Non-availability of quality seed in time, unfavorable and high cost of fertilizer and insecticides, lack of operating capital, not getting fair weight and reasonable price according to grade, affects of cattle in cotton field at maturity stage, and late buying of raw cotton by cotton development board were identified as major problems of cotton farmers in Mymensingh district.

Biswas (1992) in his study, identified farmers faced problems in cotton cultivation. Non-availability of quality seed in time, unfavorable and high cost of fertilizer and insecticides, lack of operating capital, not getting fair weight and reasonable price according to grade, affects of cattle in cotton field, lack of technical knowledge, lack of storage facility, stealing from field at maturity stage, and late buying of raw cotton by cotton development board were identified as major problems of cotton farmers in Jossore district.

Chander and Sharma (1990) in their study identified constraints in potato cultivation. Main constraints were ignorance about improved cultivars and cultivation practices, ignorance



about scientific method of sowing, lack of guidance of marketing potato; high cost of improved cultivars, high cost of fertilizer, pesticide and irrigation, lack of enough space for storing potatoes scientifically and so on.

Zinyama (1988) conducted a relative observation to find out the farmers preparations of the constraints against increased crop production in the subsistence communal farming sector of Zimbabwe. Five of the most frequently cited constraints were: (i) lack of money with which to purchase seasonal agricultural inputs, particularly fertilizers, (ii) lack of basic farming implements, notably the ox-driven single furrow plough, (iii) lack of drought cattle and (iv) inadequate arable land, and (v) inadequate family labour for agricultural work.

Kher and Halyal (1988) administered a research work to identify the constraints in adoption of sugarcane production technology. The most important constraints identified regarding the improved sugarcane production technology were an 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 facilities, absence of location specific recommendations for earthing up, lack of drought resistant varieties and lack of technical knowledge about plant protection and chemical fertilizers.

Raha *et al.* (1986) identified some common problems of cotton cultivation as perceived by the farmers in Bangladesh. The problems 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 unavailability of seed insecticide and fertilizers.

Marothia (1983) conducted a study to find out the constraints in the adoption of the technologies in two villages in Raipur Block, Madhya Pradesh, India. The findings revealed that the majority of farmers still adopt a partial package recommendation mainly due to high

cost of inputs, financial limitations and risk of production failure. Inadequate supportive input facilities were found to be responsible slow adoption of mango technology.

2.2 Studies on relationship between selected characteristic of the farmers and their problem confrontation

The literature related to the study is not available. However vegetables related literature are discussed below.

2.2.1 Age and problem confrontation

Rashid (2003) found that age of the rural youth had significant negative relationship with problem confrontation in selected agricultural production activities.

Rahman (1995) conducted a study to identify the relationship between the personal characteristics and constraints facing in cotton cultivation of Muktagacha Thana under Mymensingh district. He found that there was no significant relationship between the age of the farmers and their faced constraints in cotton cultivation. Similar findings were obtained by, Salam (2003), Halim (2003) Ahmed (2002), Pramanik (2001), Hossain (2001) and Rashid (1999) in their respective studies.

Hossain (1985) in his study found that there was no relationship between age of the landless laborers and their problem confrontation. Saha (1983), Kashem (1977), Rashid (1975) also found similar findings.

2.2.2 Education and problem confrontation

The study of Ismail (2001) revealed that there was no significant relationship between education and problem confrontation of farm youth. Similar findings were obtained by Halim (2003), Raha (1989), and Rashid (1975) in their respective studies.

Karim (1996) in his study found that education of the farmers had negative significant relationship with their problem confrontation.

Raha (1989) in his study found that education of the farmers had no significant relationship on their irrigation problem confrontation. Similar finding was obtained by Rashid (1975).

Sarker (1983) found a negative and significant relationship between education of the farmers and their poultry problem confrontation.

Thus it can be concluded that an overwhelming majority of the researcher found non-significant and a negative relationship between these two variables.

2.2.3 Family size and problem confrontation

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

Haque (1995) found that there was no significant relationship between family size and problem confrontation of the Mahila Bittahen Samabaya Samitte. Similar findings were obtained by and Halim (2003), Ahmed (2002), Hossain (2002), Bhuiyan (2002) and Rashid (1999) in their respective studies.

2.2.4 Farm size and problem confrontation

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

Ali (1999) found that family farm size of the rural youth had relationship with their anticipated confrontation in self employed by undertaking selected agricultural generating activities. Salam (2003), Bhuiyan (2002), Hossain (2002), Rashid (1999) and Saha (1997) found in their respective studies.

x Hossain (1985) found that barga farm size of the landless labourers, had significant relationship with their problem confrontation. Problem confrontation was higher in barga farming than no barga farming category.

2.2.5 Annual income and problem confrontation

Karim (1996) found that the annual income of the farmer had significant negative relationship with their problem confrontation.

Raha (1989) found that income of the farmers had no significant relationship on their irrigation problem confrontation, but relationship showed a positive tendency.

Hossain (1985) found a significant positive relationship between incomes constraints faced of the landless laborers.

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

Rashid (1975) in his study found that there was no relationship between income of the farmers and their agricultural problem confrontation. Though the relationship was not significant, relevant data indicated a considerable negative trend between income of the farmers and their agricultural problem confrontation of the farmer.

2.2.6 Organizational Participation and problem confrontation

y Karim (1996) in his study indicated that Organizational participation of the farmers had significant negative relationship with their problem confrontation.

Raha (1989) and Islam (1987) found there was no significant relationship between the organizational participation of the farmers and their problem confrontation.

Karim (1974) found a consistent negative trend between organizational participation of the Union Assistant and their problem confrontation, the relationship between the two variables was not statistically significant.

2.2.7 Cosmopolitaness and problem confrontation

Waliuzzaman (2008) found a negative significant relationship between cosmopolitaness and constraints in commercial vegetable cultivation.

Hoque (1993) study revealed a positive relationship between cosmopolitaness of the cane growers and their constraint in sugarcane cultivation. Similar findings were obtained by Islam (1993), Khan (1993) and Parveen (1993) in their respective studies.

Kashem (1977) found that there was a negative relationship between cosmopolitaness of landless labourers and their constraints faced. There was, however a negative trend between the two variables.

Rashid (1975) found that there was negative relationship between cosmopolitaness of the farmers and their agricultural constraints faced.

2.2.8 Extension Media Contact and problem confrontation

Waliuzzaman (2008) in his study found that extension contact of the farmer had significant negative relationship with their faced constraints in commercial vegetable cultivation. Similar finding were obtained by Halim (2003), Salam (2003), Hossain (2002), Pramanik (2001), Faroque (1997) and Rahman (1995), and their respective studies.

Farouque (1997) study on female youth revealed that extension contact of female rural youth had a significant negative relationship with their problem confrontation in selected issues.

Ali (1984) found that contact and non-contact farmers differed significantly in respect of their extension contact. He observed that extension contact and non-contact farmers had significant contribution towards their agricultural knowledge.

2.2.9 Area under Dyke Vegetable Cultivation and problem confrontation

Rahman (1995) found a significant and negative relationship between area under cotton cultivation of the farmers and their faced constraint.

Raha (1989) found that there was no significant relationship between the farm area under irrigation and their irrigation problem confrontation. On the other hand similar findings were obtained by Bhuiyan (2002) and Mansur (1989) in their respective studies.

The review of literature supported that different authors studied prospects of different agricultural aspects considering different parameters and their problem confrontation. The findings of the study would help the researchers in relevant field to earn knowledge on the aspects.

2.3 Prospect of Dyke vegetables farming

Cultivation of vegetables on pond dyke as a means of keeping the pond dyke clean and at the same time enhancement of overall productivity from aquaculture farms is being practiced from near past.

Integrated farming has immense potentiality to emerge out as an effective tool for improvement of rural economy due to low investment and high profitability.

Assessing Long-term Impacts and Vulnerabilities on Crop Production due to Climate Change in the Coastal Areas of Bangladesh” suggested that appropriate coping strategies and

Warrick *et al.* (1996) found Bangladesh is prone to the sea-level rise that is predicted to be associate with global warming.

BCAS, (1994) found Climate change poses now-a-days severe threat mostly in agricultural sector and food security among all other affected sectors. Crop yields are predicted to fall by up to 30 per cent, creating a very high risk of hunger and only sustainable climate-resilient agriculture is the key to enabling farmers to adapt and increase food security.

According to FAO (1977) the basic principles involved in integrated farming are the utilization of the synergetic effects of inter-related farm activities, and the conservation, including the full utilization, of farm wastes. It is based on the concept that 'there is no waste', and 'waste is only a misplaced resource which can become a valuable material for another product'.

2.4 Conceptual framework of the study

In scientific research, selection and measurement of variables constitute an important task. The hypothesis of a researcher while constructed properly contains at least two important elements i.e. "a dependent variable" and "an independent variable". Variables together are the cause and the phenomenon is effect and thus, there is cause effect relationship everywhere in the universe.

The conceptual framework of Rosenberg and Hovland (1960) was kept in mind framing the structure arrangement for the dependent variables. This study was conserved with the constraint faced by the farmers in Dyke vegetables cultivation in Mollarhat upazila of Bagherhat District. Thus the constraint was the dependent variable and selected characteristics of the farmers were considered as the independent variables.

Problem confrontation of an individual may be affected through interacting forces of many characteristics in his/her surrounding. It is not possible to deal with all characteristics in a single study.

It was therefore, necessary to limit the characteristics, which include age, education, farming experience, family size, farm size, annual income, organizational participation, cosmopolitaness, extension media contact and area under Dyke vegetable farming.

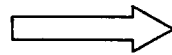
Again, in order to have a clear understanding of the nature of problem, the dependent variables were considered.

Based on this discussion and review of literature, the conceptual framework of this study has been constructed and shown in Figure 2.1.

Independent variables

Farmer's characteristics

1. Age
2. Education
3. Farming experience
4. Experience in fish farming
5. Experience in Dyke vegetable production
6. Family size
7. Farm size
8. Family income
9. Organizational participation
10. Cosmopolitaness
11. Extension media contact



Dependent variable

Problem confrontation of
Dyke vegetables cultivation
at Mollarhat upazila of
Bagerhat District

Fig. 2.1 The conceptual framework of this study

CHAPTER III

METHODOLOGY

Methodology plays an important role in scientific research. Without an appropriate methodology the researcher unable to collect valid and reliable information and to analyze that information properly in order to attain at correct conclusion.

Research methodology is a systematic way to solve a research problem. It may be understood as a science of studying how research is done (Kothari, 1990). The methods and procedures followed in conducting this study have been discussed in this chapter.

3.1 Locale of the Study

The study was conducted at four villages namely Kahalpur at Atjuri union, Joydihi, Munijela and Shawnaspur at Kotalia union and Charkulia at Kulia union of Mollarhat upazila under Bagerhat district of Bangladesh. Mollarhat Upazila (Bagerhat district) with an area of 187.44 sq km, is bounded by Kalia upazila on the north, Fakirhat and Chitalmari upazilas on the south, Chitalmari, Tungipara and Gopalganj sadar upazilas on the east, Terokhada and Rupsa upazilas on the west. As the census of 2011, it has a population of 116729; male 51.52%, female 49.48%. The density of population is 1218 per sq km. Map of Mollarhat upazila showing the unions under study area is presented in Figure 3.1.

3.2 Population and Sampling

All the farmers who are producing vegetables on Dyke of gher constituted the population of the study. A list of Dyke vegetable producing (DVP) farmers was prepared with help of Sub Assistant Agricultural Officers (SAAO, s) of the concerned blocks of the upazila. The total number of DVP farmers in the selected villages was 168 during the study. Thus the population stood 168. As the population is small in size so half of the population (i.e., 50%) which is equal to 84, were considered as sample for the study.



Figure 3.1 A map of Mollarhat upazila showing the study unions

3.3 Data Collection

3.3.1 Preparation of interview schedule

Keeping in mind the objectives of the study, an interview schedule was carefully prepared in such a way that all necessary items were included. The questionnaire was used as the research instrument in order to collect relevant information from the respondents. Simple and direct questions were included into the questionnaire. Questions were also included in the schedule to collect data on the selected variables. After preparation of the questionnaire, it was pretested before final collection of data. The pretest results helped the researcher to examine the suitability of different statements. Based upon the pretest experience, necessary correction, addition, alteration and re-arrangement were made in the questionnaire. During modification of the questionnaire, the researcher incorporated valuable suggestions from his research supervisor and co-supervisor. English version of the same questionnaire is presented in Appendix A.

3.3.2 Method and time of data collection

Data for this study were collected by the researcher herself through personal interview using the pretested questionnaire. Interviews of the respondents were taken at their homes during leisure period. At the beginning of the interview with any respondent, the researcher took all possible care to establish rapport with him so that he did not hesitate to furnish proper responses to the questions and statements in the questionnaire. The questions were explained and clarified whenever any respondent felt difficulty in understanding properly. After completion of interview, each statement was checked and verified to make sure that answer to each item had been properly recorded. For the study, data were collected during February-April, 2018.

3.4 Data Tabulation

After completion of survey, all the questionnaires were set for its data tabulation. Then all the data were summarized and scrutinized carefully. All the individual variable of the questionnaires were transferred to a master sheet to facilitate tabulation in order to meet the objectives of the study.

3.5 Data Processing

At the beginning of the data processing all the qualitative data were converted into quantitative form. Local units were converted into standard units. In several instances, indices and scales were constructed through the simple accumulation of score assigned to individual or pattern of attributes. Indices and scales were considered as the efficient instruments for data reduction and analysis. All personal traits were categorized and arranged in simple tables for interpretation and discussion. Number, frequency, mean, standard deviation and percentage were used as descriptive.



3.6 Selection and Measurement of the Variables

3.6.1 Selection of variables

A variable is any characteristics, which can assume varying or different values in successive individual cases (Ezekiel and Fox, 1959). An organized piece of research usually contains at least two important elements such as an independent and a dependent variable. 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 vanes the dependent variables (Townsend, 1953). In survey work or research, the specification and measurement of the variables constitute an important task. The personal and socio-economic

characters of the respondents were treated as independent variables for the study. The characteristics were age, educational qualification, main occupation, subsidiary occupation, experience in farming, experience in fish farming, experience in Dyke vegetable production, family size, farm size, annual income, organizational participation, cosmopolitaness, and extension media contact. Problem confrontation regarding dyke vegetable production was considered as dependent variable in this study. Besides data were also collected on Dyke area, Annual yield and income Dyke vegetable production, Irrigation facilitation, family nutrition, food security, Women involvement for study the prospects of Dyke vegetable production on ghers.

3.6.2 Measurement of independent variables

3.6.2.1 Age

The age of the respondents was measured in terms of actual years from his/her birth to the time of interview on the basis of his response/statement. It appears in items No. 1 in the questionnaire (Appendix A).The respondents were classified into following categories according to age as shown in Table 3.1.

Table 3.1 Categories of the respondents according to their age

Categories	Score (years)
Young aged	Up to 35
Middle aged	36 to 50
Old aged	>50

3.6.2.2 Educational qualification

Education was defined in terms of formal education of a respondent. It was measured by the number of years spent to acquire formal education. For example a score of '0' and '1' given for those who do not know reading and writing and can sign name respectively. A score of 5 was also given to the respondents who passed class five. Thus the level of education score of a respondent was determined from his/her response to item No. 2 in the questionnaire (Appendix A). The respondents were classified into following categories according to educational qualification as shown in Table 3.2.

Table 3.2 Categories of the respondents according to their educational qualification

Categories	Score (Year of schooling)
Illiterate	0
Primary education	1-5
Secondary education	6-10
Higher secondary education	11-12
Above higher secondary education	Above 12

3.6.2.3 Main occupation of the respondent

The main occupation all of the concerned respondent in study area were farmers. It appears in items No. 3 in the questionnaire (Appendix A)

3.6.2.4 Subsidiary occupation of the respondent

The subsidiary occupation of the respondent was measured on based on earned income from different sources besides main occupation viz. gher, business, van puller, wage labour, electrician and others. The question in case of subsidiary occupation of the respondents has been shown in the item No.4 in the questionnaire (Appendix A). The respondents were

classified into following categories according to Subsidiary occupation as shown in Table 3.3.

Table 3.3 Categories of the respondents according to their Subsidiary occupation

Categories	Code
Gher	1
Business	2
Wage labourer	3
Van puller	4
Electrician	5

3.6.2.5 Farming experience

The Farming experience of a respondent was measured on basis of the year that how long they have involved in farming activities. It appears in item No. 5 in the questionnaire (Appendix A). The respondents were classified into following categories according to their farming experience as shown in Table 3.4.

Table 3.4 Categories of the respondents according to their farming experience

Categories	Score (years)
Low experience	Up to 10
Medium experience	11 – 20
High experience	Above 20

3.6.2.6 Experience in fish (gher) farming

The experience in fish farming of a respondent was measured on basis of the year that how long they have involved in fish farming activities. It appears in item No. 6 in the questionnaire (Appendix A). The respondents were classified into following categories according to their farming experience as shown in Table 3.5.

Table 3.5 Categories of the respondents according to their fish farming experience

Categories	Score (years)
Low experience	Up to 10
Medium experience	11 – 20
High experience	Above 20

3.6.2.7 Experience in Dyke vegetable production

The experience in Dyke vegetable production of a respondent was measured on basis of the year that how long they have involved in Dyke vegetable farming activities. It appears in item No. 7 in the questionnaire (Appendix A). The respondents were classified into following categories according to their Dyke farming experience as shown in Table 3.6.

Table 3.6 Categories of the respondents according to their Dyke farming experience

Categories	Score (years)
Low experience	Up to 10
Medium experience	11 – 20
High experience	Above 20

3.6.2.8 Family size

The family size of a farmer was determined on the basis of numbers of members in his family including himself. The total number of family members was considered as the family size score of a farmer. It appears in item No.8 in the questionnaire (Appendix A). The respondents were classified into following categories according to family size as shown in Table 3.7.

Table 3.7 Categories of the respondents according to their family size

Categories	No. of family members
Small sized family	1 – 4
Medium sized family	5 –6
Large sized family	>6

3.6.2.9 Farm size

It refers to the area owned by a farmer on which he carries his farming and family business, the area being estimated in terms of full benefits to the farmer. A farmer was considered to have full benefit from cultivated area either owned by him or obtained on lease or barga from others.

The farm size of the respondents was computed in decimal using the following formula:

$$FS_1(A) = A_1 + A_2 + \frac{1}{2}(A_3 + A_4) + A_5 + A_6$$

Where, FS (A) = Farm size

A_1 = Homestead

A_2 = Own land under own cultivation

A_3 = Land given to others on barga

A_4 = Land taken from others on barga

A_5 = Land taken from others on lease

A_6 = Others

The farm size was measured in terms of hectare considering the total land area under the possession of a respondent. Farm size is shown in item No.9 in the questionnaire (Appendix A). According to farm size they were divided into five groups which are as follows in Table 3.8.

Table 3.8 Categories of the respondents according to their farm size

Categories	Score (ha)
Landless	<0.02
Marginal farmers	0.02 -0.20
Small farmers	0.21- 1.0
Medium farmers	1.01-3.0
Large farmers	>3

3.6.2.10 Annual income

The yearly income referred to the income of a respondent earned from different sources viz. agriculture, business, service, day laborers and others. The question to measure annual income of the respondents has been shown in the item No.10 in the questionnaire (Appendix A). The respondents were classified into following categories according to annual income as shown in Table 3.9.

Table 3.9 Categories of the respondents according to their annual income

Categories	Taka ('000Tk)
Low income	150
Medium income	150 -300
High income	Above 300

3.6.2.11 Organizational participation

Organizational participation score of a respondent was measured on the basis of number of organizations involved by the respondent considering his nature of participation, A score of '1' was given to the respondent who participate in any organization and a score '0' given to those respondent who do not participate in any organization. The organization participation score of a respondent was calculated by the number of organization he/she participated. For example respondents had participated 3 organizations, his/her organization participation score was 3. The participation score of a respondent could ranged from 0 to 10. Based on organizational participation scores, the respondents were classified into different categories as shown in Table 3.10.

Table 3.10 Categories of the respondents according to their organizational participation

Categories	Score (Number)
No	0
Low	1-3
Medium	4-6
High	>6

3.6.2.12 Cosmopolitaness

Cosmopolitaness of the respondent was measured by the frequencies of visit to the places external to his own social system. The respondent was asked to mention the number of visits made in five different places in terms of frequently, occasionally, rarely and not at all and the scores were 3, 2, 1 and 0 respectively. The cosmopolitaness score of a respondent was calculated by summing up of all the scores obtained by him against the places of visit included in the questionnaire (Item No.12; questionnaire; Appendix A). The respondents were classified into the following categories based on the cosmopolitaness scores as shown in Table 3.11.

Table 3.11 Categories of the respondents according to their cosmopolitaness

Categories	Score
Low	≤ 4
Medium	5-8
High	9-12

3.6.2.13 Extension media contact

In this study, the extension media contact score was computed for each respondent on the basis of the extent of his contact with selected media. It appears in items No.14 in the questionnaire (Appendix A). A five point rating scales such as regularly, occasionally, rarely and not at all were employed against each of the extension media and a score of 3, 2, 1 and 0 was assigned against the rating scales respectively. The respondents were asked to indicate their extent of contact with each of the extension media. The extension media contact score of a respondent was calculated by adding all the scores obtained by him against all of his selected extension media. The extension media contact score of a respondent could range

from '0 to 36' where '0' indicates no contact and '36' indicate high contact. The respondents were classified into following categories according to extension media contact as shown in Table 3.12.

Table 3.12 Categories of the respondents according to their extension media contact

Categories	Score
Low	1-12
Medium	13-24
High	>24

3.7 Information related to Dyke vegetable production for determining its prospects:

The Prospects of Dyke vegetable production in ghers was studied / observed based on following parameters:

1. Area of Dyke on ghers
2. Annual yields from Dyke Vegetable production from per unit area
3. Irrigation Facilitation
4. Family Nutrition
 - Name of vegetables grown on Dyke
5. Food Security
 - Present amount of land used under Dyke vegetable cultivation
 - Previous amount of land used under Dyke vegetable cultivation
 - Name of the lean period grown vegetables
6. Women involvement by dyke vegetables farming

3.7.1 Area of Dyke on ghers of the respondents

The researchers recorded information about total Dyke area on ghers of the respondent's. The question to measure total Dyke area under Dyke vegetable cultivation of the respondent's

ghers has been shown in the item number B.1 of interview schedule (Appendix 1). The respondents were classified based on total Dyke area under Dyke vegetable production into following categories that are shown Table 3.13.

Table 3.13 Categories of the respondents according to their total Dyke area

Categories	Score (Number)
Small	$< (\bar{X} - Sd)$
Medium	$(\bar{X} - Sd) \leftrightarrow (\bar{X} + Sd)$
Large	$>(\bar{X} + Sd)$

3.7.2 Annual yields and income from Dyke Vegetable production from per unit area

The annual yield and income from Dyke vegetable production referred to annual vegetables production and the income of a respondent earned from Dyke farming. The question to measure annual yield and income from Dyke vegetable production of the respondents has been shown in the item number B.2 of interview schedule (Appendix 1). The Yield and income from Dyke farming of a respondent was measured in terms of kilogram as and taka respectively. The respondents were classified based on annual yield and income from roof gardening into following categories that are shown Table 3.14 and 3.15 respectively.

Table 3.14 Categories of the respondents according to their yield from Dyke farming

Categories	Score (kg)
Low	$< (\bar{X} - Sd)$
Medium	$(\bar{X} - Sd) \leftrightarrow (\bar{X} + Sd)$
High	$>(\bar{X} + Sd)$

order to determining capacity building through women empowerment. Women involvement by dyke vegetables farming has been shown in the item number B.6 of interview schedule (Appendix 1).

3.8 Problem confrontation of Dyke vegetable cultivation

3.8.1 Problems faced by the respondents in Dyke vegetable cultivation

The respondents were asked about the problem they faced during Dyke vegetable cultivation with their severity. The respondent faced more or less faced 30 problems to different extent. An item was prepared in the interview schedule (Item no. Part C; Appendix 1). A 4 point rating scale such as highly severe, severe, less severe and not at all was assigned against each of the problems to indicate the severity, and a score of 3,2,1 and 0 was assigned against each of the scales respectively. The problem confrontation score of a respondent was determined by summing up all the scores obtained by the respondent against the all problems.

The problem confrontation score of respondents could range from '0' to '90' where '0' indicated no problem confrontation while 90 indicated high problem confrontation. Based on the problem confrontation score, the respondents were also classified into three categories as shown in the Table 3.16.

Table 3.16 Distribution of respondents according to their problem confrontation score

Categories	Score
Low	1-30
Medium	31-60
High	61-90

Severity rank order of problem faced by the respondents in Dyke vegetable cultivation in gher are shown in Table 3.17.

Table 3.17 Rank order of problem in Dyke vegetable cultivation of the respondents

Type of problem	Rate of problem			
	Highly severe (3)	Severe (2)	Less severe (1)	Not at all (0)
1. Unavailability of seed and/ seedlings				
2. High price of seed / seedlings				
3. Problem of seed germination				
4. Purity of seed				
5. Lack of knowledge for selecting appropriate vegetables				
6. Unavailability of fertilizer in season				
7. High demand and high price of Fertilizer				
8. Lack of good quality fertilizer				
9. Lack of knowledge of balanced fertilizer				
10. Fertilizer enhance insect attack				
11. Lack of technical knowledge of Fertilizer application				
12. Deficiency of irrigation water in season				
13. Contamination of salinity in irrigation water				
14. High percentage of insect attack				
15. High percentage of diseases				
16. High price of insecticide or pesticide				
17. Lack of technical knowledge for identification of Insects				
18. Lack of technical knowledge for identification of Diseases				
19. Poor productivity				
20. Low market price in respect of production cost				
21. Lack of marketing facilities				
22. Lack of preservation facilities				
23. Lack of loan facilities				
24. Lack of information				
25. Salinity reduce the productivity				
26. Rats attack				
27. Security of products				
28. Shortage of labor				
29. High wage of labor				
30. Others (Specify)				

To determine the severity of a problem, problem confrontation index (PCI) was calculated by using the following formula:

$$PCI = N_h \times 3 + N_s \times 2 + N_l \times 1 + N_n \times 0$$

When,

PCI = Problem Confrontation Index

N_h = Number of respondents rated the problem as highly severe

N_s = Number of respondents rated the problem as severe

N_l = Number of respondents rated the problem as less severe

N_n = Number of respondents rated the problem as not at all a problem

The PCI score of the respondents could range from '0' to 252 where '0' indicate not at all a problem and 252 indicate the highly severe problem.

3.9 Data Analysis

Data were compiled, tabulated and analyzed based on the objectives of the study. Different statistical treatments such as number, mean, standard deviation, range, minimum, maximum and percentage were used to describe the variables. To explore relationship between any two variables, Pearson Product Correlation Coefficient (r) was used. Data analysis was done using the concerned software Microsoft Excel and Statistical Package for Social Science.

CHAPTER IV

RESULTS AND DISCUSSION

The findings of the study and interpretation of results with necessary discussion have been presented in this chapter. The results of this study have been presented in three sections. Firstly the selected characteristics of the respondents have been presented in section 4.1 and the prospects and problem confrontation of Dyke vegetable production are presented in the following sections viz. 4.2 and 4.3, respectively.

4.1 Selected characteristics of the respondents

4.1.1 Age of the respondent

The age of the respondents was markedly varied. Their age ranged from 20-70 years with mean and standard deviation of 45.39 and 11.45 respectively. The respondents were classified into three categories as shown in Table 4.1.

Table 4.1 Distribution of the respondents according to their age

Categories	Scores (Years)	Respondents(N=84)		Mean	Standard Deviation	Min.	Max.
		Number	Percentage				
Young	≤ 35	18	21.4	45.39	11.45	20	70
Middle	36-50	42	50.0				
Old	>50	24	28.6				
Total		84	100				

Data furnished in Table 4.1 revealed that half (50%) of the respondents were middle aged as compared to 21.4% young aged and 28.6% being old aged. It is evident that young to middle aged people (71.4%) are more engaged in Dyke vegetable cultivation for gaining quickly double profit from gher shrimp farming as well as Dyke vegetable production.

4.1.2 Educational qualification

The educational level of the respondents ranged from 0-12 with mean and standard deviation of 1.96 and 0.79 respectively. On the basis of education, the respondents were classified into five categories as shown in Table 4.2.

Table 4.2 Distribution of the respondents according to their educational qualification

Categories	Score (Years of school)	Respondent (N=84)		Mean	Standard Deviation	Min.	Max.
		Number	Percentage				
Illiterate	0	26	31.0	1.96	0.79	0	12
Primary	1-5	37	44.0				
Secondary	6-10	19	22.6				
Higher secondary	11-12	2	2.4				
Above higher secondary	>12	0	0				
Total		84	100				

Data presented in Table 4.2 demonstrate that highest proportion (44.0%) of the respondents had primary level of education followed by illiterate (31.0%) & secondary (22.6%). Only a few (2.4%) of the respondents had Higher Secondary level of education. It is clear from the study that all the respondents who are involved in Dyke vegetable production were not highly educated where none of the respondents had above higher secondary level of education. Illiterate to primary education level of respondents (75%) are encouraged by shrimp production to get high quantity of profit quickly instead of continuing their education.

4.1.3 Main occupation of the respondent

The main occupation all of the concerned respondent in study area were farmers.

4.1.4 Subsidiary occupation of the respondent

The Subsidiary occupation of the respondents ranged from 1-5 where “1” means Gher, “2” means Business, “3” means Wage labour, “4” means Van puller and “5” means Electrician. Data presented in Table 4.3 demonstrate that highest proportion (82.1%) of the respondents had gher. Only a few (9.5% and 4.8%) of the respondents related to business and van pulling occupation respectively followed by wage labour (2.4%) and electrician (1.2%).

Table 4.3 Distribution of the respondents according to their Subsidiary occupation

Categories	Code	Respondents(N=84)		Rank
		Number	Percentage	
Gher	1	69	82.1	1 st
Business	2	8	9.5	2 nd
Wage labour	3	2	2.4	4 th
Van puller	4	4	4.8	3 rd
Electrician	5	1	1.2	5 th
Total		84	100	

From the result it is observed that gher ranked height among the subsidiary occupation. The area is saline prone and it is easier and profitable to culture shrimps. Most of the respondents earned higher amount of money from it that's why gher is the mostly performed subsidiary occupation.

4.1.5 Farming experience

The farming experience of the respondents ranged from 6-50 years with mean of 19.01 and standard deviation of 9.21. On the basis of farming experience the respondents were classified into three categories as shown in Table 4.4.

Table 4.4 Distribution of respondents according to their farming experience

Categories	Score (Year)	Respondent (N=84)		Mean	Standard Deviation	Min.	Max.
		Number	Percentage				
Low	≤10	14	16.7	19.01	9.21	6	50
Medium	11-20	49	58.3				
High	>20	21	25.0				
Total		84	100				

The findings of the study indicate that majority of the respondents (58.3%) had medium experience followed by high experienced (25.0%) and had low experienced (16.7%). It was clear from the study that most (83.3%) number of respondents had medium to high experience in farming due to high market price.

4.1.6 Experience in fish (gher) farming

The experience in fish farming score of the respondents ranged from 5 to 30 with a mean and standard deviation of 13.45 and 4.83, respectively. Based on experience in fish farming, the respondents were classified into low (≤10), medium (11-20) and high (>20) categories as shown in Table 4.5.

Table 4.5 Distribution of the respondents according to their experience in fish farming

Categories	Score (Year)	Respondent (N=84)		Mean	Standard Deviation	Min.	Max.
		Number	Percentage				
Low	≤10	28	33.3	13.45	4.83	5	30
Medium	11-20	53	63.1				
High	>20	3	3.6				
Total		84	100				

Table 4.5 indicates that majority of the respondents (63.1%) were medium experienced in fish farming followed by low experienced (33.3%) and only 3.6% respondents had high experience.

4.1.7 Experience in Dyke vegetable cultivation

The experience in Dyke vegetable cultivation of the respondents ranged from 4-20 years with mean of 9.79 and standard deviation of 3.07. On the basis of farming experience on Dyke of the respondents were classified into three categories as shown in Table 4.6. The findings of the study indicate that majority of the respondents (77.4%) had low experience followed by medium experienced (22.6%). None of the respondents had high experience.

Table 4.6 Distribution of respondents according to their Dyke farming experience

Categories	Score (Year)	Respondent (N=84)		Mean	Standard Deviation	Min.	Max.
		Number	Percentage				
Low	≤10	65	77.4	9.79	3.07	4	20
Medium	11-20	19	22.6				
High	>20	0	0				
Total		84	100				

Comparison between two experiences in fish farming and Dyke vegetable farming, Majority of the respondents had medium to high level of experience (66.7%) in fish farming whereas only few respondents had (22.6%) in Dyke vegetable farming. Most of the respondents who involved in fish farming are not performed in Dyke vegetable cultivation but they are capable to do it. If they can be brought themselves under Dyke vegetable production will definitely have an additional income from that grown vegetables.

4.1.8 Family size

The family size of the respondents ranged from 2- 9 with mean and standard deviation of 1.51 and 0.63 respectively. On the basis of family size, the respondents were classified into three categories as shown in Table 4.7.

Table 4.7 Distribution of the respondents according to their family size

Categories	Score (Number)	Respondent (N=84)		Mean	Standard Deviation	Min.	Max.
		Number	Percentage				
Small	1-4	47	56.0	1.51	0.63	2	9
Medium	5-6	31	36.9				
Large	>6	6	7.1				
Total		84	100				

Data presented in Table 4.7 indicate that majority (56.0%) of the respondents' family belonged to small sized family followed by medium sized family (36.9%) while only about 7.1% belonged to large sized family. It means that most (92.9%) of the people are highly conscious about family planning.

4.1.9 Farm size

Farm size of the respondents in the study area varied from 0.03-1.73 ha with mean of 0.72 and standard deviation of 0.37. Based on the farm size, the respondents were classified into five categories as presented in Table 4.8.

4 Table. 8 Distribution of the respondents on the basis of their Farm Size

Categories	Score (ha)	Respondents (N=84)		Mean	Standard Deviation	Min.	Max.
		Number	Percentage				
Landless	<0.02	0	0	0.72	0.37	0.03	1.73
Marginal	0.02-0.20	4	4.8				
Small	0.21-1.00	65	77.4				
Medium	1.01-3.00	15	17.9				
Large	>3.00	0	0				
Total		84	100				

Data presented in Table 4.8 indicate that majority (77.4%) of the respondents had small farm size compared to medium (17.9%) and marginal (4.8%) farm size. None of the respondent belongs to landless and large farm categories.

4.1.10 Annual income

The annual incomes of the respondents were ranged from 99-1839 ('000Tk) with a mean and standard deviation of 348.56 ('000Tk) and 199.40 ('000Tk) respectively. On the basis of their annual income, the respondents were classified into three categories as shown in Table 4.9.

Table 4.9 Distribution of the respondents according to their annual income

Categories	Scores (‘000Tk)	Respondents (N=84)		Mean	Standard Deviation	Min.	Max.
		Number	Percentage				
Low income	≤150	0	1.2	348.56	199.40	99.6	1839
Medium income	150-300	1	36.9				
High income	>300	83	61.9				
Total		84	100				

Data furnished in Table 4.9 reveal that majority (61.9%) of the respondents belonged to higher income group as compared to medium (36.9%) income group and low income (1.2%). Findings indicate that high income but low educational qualification group peoples were more engaged in Dyke vegetable production on gher to get additional income from there quickly.

Table4.11 Distribution of the respondents according to their cosmopoliteness

Categories	Score	Respondent (N=84)		Mean	Standard Deviation	Min.	Max.
		Number	Percentage				
Low	≤4	0	0	8.09	1.38	5	11
Medium	5-8	49	58.3				
High	9-12	35	41.7				
Total		84	100				

It was found that most of the respondents (58.3%) were medium cosmopolite while 41.7% were high cosmopolite and there were no respondents of low cosmopoliteness. Findings indicate that almost every respondent were more or less cosmopolite.

4.1.13 Extension media contact

The extension media contact scores of the respondents ranged from 6- 19with a mean of 12.69 and standard deviation of 2.85. Depending upon the individual participation scores, the respondents were grouped into following categories as shown in Table 4.12.

Table4.12 Distribution of the respondents according to their extension media contact

Categories	Score	Respondent (N=84)		Mean	Standard Deviation	Min.	Max.
		Number	Percentage				
Low	1-12	38	45.2	12.69	2.85	6	19
Medium	13-24	46	54.8				
High	>24	0	0				
Total		84	100				

Majority of the respondents (54.8%) had medium scale extension media contact followed by low scale extension media contact (45.2%). None of the respondent belongs to high contact categories. Thus, it can be concluded that most of the respondents were more or less aware of the services provided by different extension agencies.

4.2 Prospects of Dyke vegetable production in ghers

The Prospects of Dyke vegetable production in ghers was studied / observed based on following parameters:

7. Area of Dyke on ghers
8. Annual yields from Dyke Vegetable production from per unit area
9. Irrigation Facilitation
10. Family Nutrition
 - Name of vegetables grown on Dyke
11. Food Security
 - Present amount of land used under Dyke vegetable cultivation
 - Previous amount of land used under Dyke vegetable cultivation
 - Name of the lean period grown vegetables
12. Women involvement by dyke vegetables farming

4.2.1 Area of Dyke on ghers of the respondents

The Dyke area of the respondents under study ranged from 2.38 to 28.41(decimal) with a mean and standard deviation of 11.38 (decimal) and 4.44(decimal) , respectively. Based on Dyke area, the respondents were classified into three categories as shown in Table 4.13.

Table 4.13 Distribution of the respondents according to their total Dyke area

Categories	Score (Decimal)	Score (Decimal)	Respondent (N=84)		Mean	Standard Deviation	Min.	Max.
			Number	Percentage				
Small	$< (\bar{X} - Sd)$	< 6.94	11	13.1	11.38	4.44	2.38	28.41
Medium	$(\bar{X} - Sd) \leftrightarrow (\bar{X} + Sd)$	$6.94 \leftrightarrow 15.82$	61	72.6				
Large	$> (\bar{X} + Sd)$	> 15.82	12	14.3				
Total			84	100				

Majority of the respondents had medium sized Dyke area (72.6%) followed by large sized Dyke area (14.3%) and small sized Dyke area (13.1%). It was found that most (86.9%) of the respondent had medium to large sized of Dyke that's why respondents can brought their Dyke area under vegetables cultivation in order to get additional incomes from there instead of remains fallow year after year.

4.2.1 Annual yields from Dyke Vegetable production

The Annual yields from Dyke Vegetable production of the respondents under study ranged from 990 to 10700 with a mean and standard deviation of 6458.3 and of 1814.36, respectively. Based on yields from Dyke Vegetable production, the respondents were classified into three categories as presented in the Table 4.14.

Table 4.14 Distribution of the respondents according to their annual yields from Dyke Vegetables production

Categories	Score (kilogram)	Score (kilogram)	Respondent (N=84)		Mean	Standard Deviation	Min.	Max.
			Number	Percentage				
Low	$< (\bar{X} - Sd)$	< 4643.97	15	17.9	6458.3	1814.36	990	10700
Medium	$(\bar{X} - Sd) \leftrightarrow (\bar{X} + Sd)$	$4643.97 \leftrightarrow 8272.69$	60	71.4				
High	$> (\bar{X} + Sd)$	> 8272.69	9	10.7				
Total			84	100				

Data furnished in Table 4.13 reveal that majority (71.9%) of the respondents belonged to medium yield group as compared to lower (17.9%) and higher (10.9) yield group. It is calculated that in study area respondents got average 218.47 kg vegetable production (annual) per decimal Dyke area that is completely extra production. Usually Dyke remains empty and not use for any productive purpose. If the fallow Dyke brought under vegetable production, respondent definitely get additional production that can be used for selling in local market as well as family consumption.

4.2.3 Annual income from Dyke Vegetable production

The annual income from Dyke vegetable production score of the respondents ranged from 17.08 ('000Tk) to 178 ('000Tk) with a mean and standard deviation of 116.46 and 35.08, respectively. On the basis of the annual income the respondent's family was classified into three categories as shown in Table 4.15.

Table 4.15 Distribution of the respondents according to annual income Dyke Vegetable production

Categories	Scores (^{'000} Tk)	Respondents (N=84)		Mean	Standard Deviation	Min.	Max.
		Number	Percentage				
Low	≤75	14	16.7	116.46	35.08	17.08	178
Medium	75-150	57	67.9				
High	>150	13	15.5				
Total		84	100				

It was found that majority (67.9%) of the respondents were in the category of medium income followed by low income (16.7%) and high income (15.5%). Findings indicate that maximum medium income obtained from Dyke vegetable farming. It is calculated that Respondent got 3383.807 Tk. (annual) per decimal Dyke area in cultivating vegetables that is an additional income. There is no need to extra attention for Dyke vegetable cultivation. So in this areas having a lot of scope for earning income through judicious use of Dyke for production of vegetables on gher.

4.2.4 Irrigation Facilitation

Irrigation Facilitation score of a respondent was measured on the utilization of gher water for Dyke vegetables production. Depending upon the Irrigation Facilitation scores, the respondents were grouped into following categories as shown in Table 4.16.

Table 4.16 Distribution of the respondents according to Irrigation Facilitation

Categories	Code	Respondent (N=84)	
		Number	Percentage
No	0	0	0
Yes	1	84	100
Total		84	100

All (100%) of the respondents used gher water for irrigation in Dyke vegetable cultivation. It is a no cost input methods for Dyke vegetable cultivation.

4.2.5 Family Nutrition

Vegetables grown in Dyke vegetables farming of the study area have been accessible in the Table 4.17. Most (92.85%) of the respondents grown cucumber and bitter gourd in the Dyke followed bottle gourd (47.61%) and tomato (36.90%). This might be due to the high price of those vegetables. By consuming that fresh vegetable the nutritional status as well as livelihood status of farmer's family will also be improved in this way.

Table 4.17 Distribution of the respondents based on the types of vegetables grown in Dyke of the study area

Vegetables name	Respondent (N=84)		Rank Order
	Citation	Percentage	
Tomato	31	36.90	3 rd
Cucumber	78	92.85	1 st
Bottle gourd	40	47.61	2 nd
Sweet gourd	28	33.33	4 th
Bitter gourd	78	92.85	1 st
Brinjal	4	4.76	5 th
Cabbage	2	2.38	7 th
Papaya	1	1.19	8 th
Ribbed gourd	3	3.57	6 th

4.2.6 Food security

4.2.6.1 Present amount of land used in Dyke vegetable production in gher

The present amount of Dyke area of the respondents under study ranged from 0.01-0.22 (hectare) with a mean and standard deviation of 0.05 (hectare) and 0.02 (hectare), respectively. Based on Dyke area, the respondents were classified into three categories as shown in Table 4.18.

Table 4.18 Distribution of the respondents related to present amount of land used in Dyke vegetable production in gher

Categories	Score (Number)	Score (Number)	Respondent (N=84)		Mean	Standard Deviation	Min.	Max.
			Number	Percentage				
Small	$<(\bar{X} - Sd)$	<0.03	12	14.3	0.05	0.02	0.01	0.22
Medium	$(\bar{X} - Sd) \leftrightarrow (\bar{X} + Sd)$	$0.03 \leftrightarrow 0.07$	61	72.6				
Large	$>(\bar{X} + Sd)$	>0.07	11	13.1				
Total			84	100				

Majority of the respondents had medium sized Dyke area (72.6%) followed by large sized Dyke area (14.3%) and small sized Dyke area (13.1%).

4.2.6.2 Previous amount of land used in Dyke vegetable production in gher

The previous amount of Dyke area of the respondents under study ranged from 0.01-0.07(hectare) with a mean and standard deviation of 0.04 (hectare) and 0.01 (hectare), respectively. Based on Dyke area, the respondents were classified into three categories as shown in Table 4.19. Majority of the respondents had medium sized Dyke area (51.2%) followed by large sized Dyke area (44.0%) and small sized Dyke area (4.8%).

Table 4.19 Distribution of the respondents related to previous amount of land used in Dyke vegetable production in gher

Categories	Score (Number)	Score (Number)	Respondent (N=84)		Mean	Standard Deviation	Min.	Max.
			Number	Percentage				
Small	$<(\bar{X} - Sd)$	<0.03	4	4.8	0.04	0.01	0.01	0.07
Medium	$(\bar{X} - Sd) \leftrightarrow (\bar{X} + Sd)$	$0.03 \leftrightarrow 0.05$	43	51.2				
Large	$>(\bar{X} + Sd)$	>0.05	37	44.0				
Total			84	100				

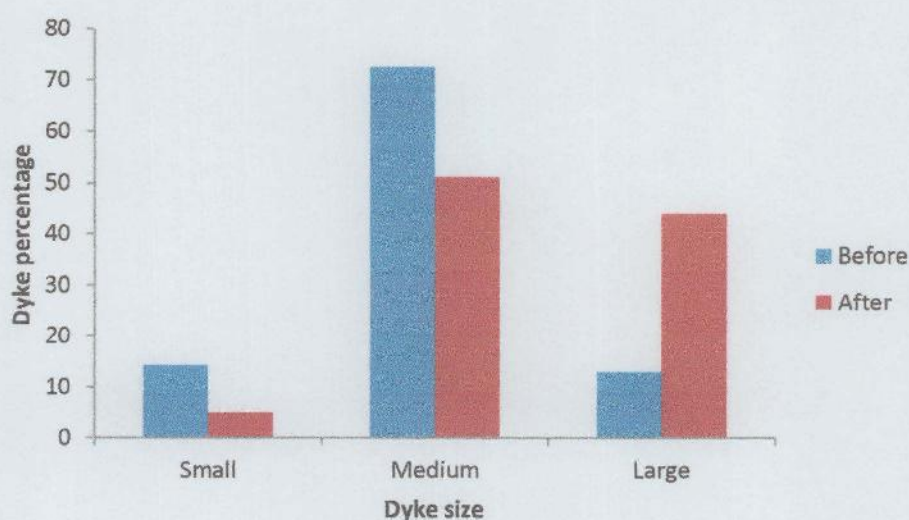


Figure 4.2.6 Comparison between present and previous amount of land used in Dyke vegetable farming

The amount of small and medium size Dyke area in gher reduces compared with large Dyke area due to low production that is not sufficient to continue gher farming. But the farmers who have large sized Dyke in gher continued due to high quantity of profit. Usually the Dyke remains empty and not used for any production purpose. If the fallow dykes are brought under vegetable cultivation by using improved methods, the shrimp farmers will definitely have an additional income from that grown vegetables.

4.2.6.3 Name of the Vegetables grown in Lean period

Vegetables grown in Dyke in gher during lean period of the study area have been accessible in the Table 4.20. Majority (51.19%) of the respondents grown Lady s finger in the Dyke during followed brinjal (48.81%) and tomato (47.61%).

Table 4.20 Distribution of the respondents based on the types of vegetables grown in Dyke of the study area during lean period

Vegetables name	Respondent (N=84)		Rank Order
	Citation	Percentage	
Tomato	40	47.61	3 rd
Brinjal	41	48.81	2 nd
Pea	18	21.42	5 th
Sweet gourd	25	29.76	4 th
Papaya	10	11.91	6 th
Lady s finger	43	51.19	1 st
Cucumber	2	2.38	7 th
Bitter gourd	1	1.19	8 th =
Ribbed gourd	1	1.19	8 th =

Usually during lean period, vegetables scarcity found in market as well as farmer's field due to low vegetable production. If the fallow dykes are brought under vegetable cultivation by using improved methods in that time. Farmers will ensure the availability of vegetables in market and also ensures their family nutrition.

4.2.7 Women involvement by dyke vegetables farming

The women of the study are not involved in Dyke vegetables cultivation due to social as well as religious barriers. Usually women are habituated to cultivate vegetables in their homestead area. The capacity will be build up by utilizing them in Dyke vegetable production in gher where they can access easily.

4.3 Problems confronted by the respondents in Dyke vegetables cultivation More or less the farmers faced 30 problems in Dyke vegetable production.

4.3.1 Overall Problem confrontation

The obtained problem confrontation scores of the respondents ranged from 29-50 against the possible range of 0-90 with a mean and standard deviation of 39.54 and 4.90 respectively. Based on possible problem confrontation scores, the respondents have been classified into three categories as shown in Table 4.21.

Table 4.21 Distribution of the respondents according to their problem confrontation

Categories	Score	Respondent (N=84)		Mean	Standard Deviation	Min.	Max.
		Number	Percentage				
Low	1-30	3	3.6	39.54	4.90	29	50
Medium	31-60	81	96.4				
High	61-90	0	0				
Total		84	100				

Data presented in Table 4.18 reveal that most (96.4 %) of the farmers had medium problem confrontation while 3.6% of the farmers had low problem confrontation. None of the farmers had high problem confrontation.

4.3.2 Severity of the problem related to Dyke vegetables cultivation in the study area

The famers of the study area were asked to indicate the problems as confronted by them along with their severity. The farmers of the study area confronted 30 problems to different extent. Data presented in Table 4.22 indicate that Lack of technical knowledge for identification of Diseases was the highly severe problem while Unavailability of fertilizer in season was the least severe problem. The other major problems were Lack of technical knowledge for identification of Insects, High percentage of insect attack, Fertilizer enhance insect attack, Rats attack.

Table 4.22 Rank order of problems based on problem confrontation index

Types of problem	Severity of the problems (N=84)					PCI		Rank order
	HS (3)	MS (2)	LS (1)	NAA (0)	Total	Score	Percentage	
Unavailability of seed and/ seedlings	3	20	47	14	84	96	38.09	17 th
High price of seed / seedlings	1	28	75	5	84	109	43.25	14 th
Problem of seed germination	1	13	50	20	84	79	31.34	24 th
Purity of seed	4	27	44	9	84	110	43.65	13 th
Lack of knowledge for selecting appropriate vegetables	5	33	38	8	84	119	47.22	10 th
Unavailability of fertilizer in season	1	16	33	34	84	68	26.98	25 th
High demand and high price of Fertilizer	1	18	47	18	84	86	34.12	22 th
Lack of good quality fertilizer	2	22	32	28	84	82	32.53	23 th
Lack of knowledge of balanced fertilizer	16	24	31	13	84	127	50.39	8 th =
Fertilizer enhance insect attack	33	17	25	9	84	158	62.69	4 th
Lack of technical knowledge of Fertilizer application	16	26	27	15	84	127	50.39	8 th =
Deficiency of irrigation water in season	1	18	50	15	84	89	35.31	20 th
Contamination of salinity in irrigation water	2	17	48	17	84	88	34.92	21 th =
High percentage of insect attack	35	16	22	11	84	159	63.09	3 rd
High percentage of diseases	8	25	39	12	84	113	44.84	12 th
High price of insecticide or pesticide	16	22	34	12	84	126	50.00	9 th
Lack of technical knowledge for identification of Insects	31	31	16	6	84	171	67.85	2 nd
Lack of technical knowledge for identification of Diseases	47	16	18	3	84	191	75.79	1 st
Poor productivity	5	31	32	16	84	109	43.25	14 th
Low market price in respect of production cost	13	26	37	8	84	128	50.79	7 th
Lack of marketing facilities	9	15	43	17	84	100	39.68	16 th
Lack of preservation facilities	22	14	22	26	84	116	46.03	11 th
Lack of loan facilities	3	14	51	16	84	88	34.92	21 th =
Lack of information	18	25	25	16	84	129	51.19	6 th
Salinity reduce the productivity	5	17	43	19	84	92	36.50	19 th =
Rats attack	35	13	10	26	84	141	55.95	5 th
Security of products	13	17	35	19	84	108	42.85	15 th
Shortage of labor	3	20	46	15	84	95	37.69	18 th
High wage of labor	3	19	45	17	84	92	36.50	19 th =

HS= Highly severe, S= Severe, LS= Less severe, NAA= Not at all, PCI= Problem confrontation index

4.4 Relationship between the selected characteristics of the respondents and their problem confrontation in Dyke vegetable farming

The purpose of this section is to examine and describe the relationship between the selected characteristics of the respondents and their problem confrontation. To explore the relationship between the selected characteristics of farmers and their problem confrontation, "Pearson's Product-Moment Correlation Co-efficient 'r' was used which has been shown in the Table 4.23.

Table 4.23 Relationship between the selected characteristics of farmers and their problem confrontation

Characteristics (Independent variable)	Dependent variable	Correlation coefficient
1. Age	Problem Confrontation of Dyke vegetable production	-0.150 ^{NS}
2. Level of Education		0.123 ^{NS}
3. Experience in farming		-0.117 ^{NS}
4. Experience in fishing		-0.082 ^{NS}
5. Experience in Dyke vegetable cultivation		-0.083 ^{NS}
6. Family Size		-0.090 ^{NS}
7. Farm Size		-0.002 ^{NS}
8. Annual family income		0.279*
9. Organizational participation		0.165 ^{NS}
10. Cosmopolitaness		-0.041 ^{NS}
11. Extension contact		-0.286**

NS= Non-significant **. Correlation is significant at the 0.01 level (2-tailed) * Correlation is significant at the 0.05 level (2-tailed)

Among the 11 selected characteristics of the respondents, Extension contact showed a negative significant relationship with the problem confrontation. It means that the higher is the extension contact; the lower is the problem confrontation of the respondents in Dyke vegetable cultivation. On the other hand, the annual family income showed a positive

significant relationship with the problem confrontation. It means that the higher is the annual family income, the higher is the ability of the farmers to identify the problems in Dyke vegetable cultivation. The age, education, experience in farming, experience in fishing, experience in Dyke vegetable farming, family size, farm size, annual income and cosmopolitaness of the respondents showed a negative but non-significant relationship with the problem confrontation. Only organizational participation showed a positive but non-significant relationship with the problem confrontation of the farmers.

CHAPTER V

SUMMARY AND CONCLUSIONS

5.1 Summary of Findings

We know Bangladesh is an overpopulated country. So food shortages and malnutrition have become general problems in country. Vegetables are considered as an indispensable part of our daily diet, yet it contributes a very little portion of our total food intake because of short supply and health unawareness. Almost all the vegetables grow in Bangladesh are traditional types and are grown mainly during winter season. Present study was undertaken to determine the prospects of Dyke vegetable production and problem confrontation by Dyke vegetables grower at Mollarhat upazila of Bagerhat District. Again assessing the impact of Dyke vegetable production on food security are important objectives of the study. The study was conducted at Mollarhat upazila in Bagerhat District. Data were collected from 84 respondents through an interview schedule. A summary of the major findings is given in the subsequent sections.

5.1.1 Characteristics of respondents

Majority (71.4%) of the respondents belonged to young to middle aged categories .It is evident that young to middle aged people are more engaged in Dyke vegetable cultivation for gaining quickly double profit from gher shrimp farming as well as Dyke vegetable production.

The highest proportion (44.0%) of the respondents had primary level of education followed by illiterate (31.0%). Only a few (2.4%) of the respondents had Higher Secondary level of education. It is clear from the study that all the respondents who are involved in Dyke vegetable production were not highly educated where none of the respondents had above

higher secondary level of education. Illiterate to primary education level of respondents (75%) are encouraged by shrimp production to get high quantity of profit quickly instead of continuing their education.

Most (100%) of the respondents main occupation was farmer in study area. Besides Majority (82.1%) of the respondents' subsidiary occupation had gher. Only a few (17.9%) of the respondents related to business, van pulling, wage labor and electrician occupation respectively. From the result it is observed that gher ranked height among the subsidiary occupation. Most of the respondents earned higher amount of money from gher that's why gher is the mostly performed subsidiary occupation due to high profit.

The most of the respondents (83.3%) in farming experience had medium to high experience followed by low experienced (16.7%). It was clear from the study that highest number of respondents had medium to high experienced in farming due to high market price.

Majority (66.7%) of the respondents had medium to high level of experience in fish farming whereas only few respondents had (22.6%) in Dyke vegetable farming. Most of the respondents who involved in fish farming are not performed in Dyke vegetable cultivation but they are capable to do it. If they can be brought themselves under Dyke vegetable production will definitely have an additional income from that grown vegetables.

Majority (56.0%) of the respondents' family belonged to small sized family followed by medium sized family (36.9%) while only about 7.1% belonged to large sized family. It means that most (92.9%) of the people are highly conscious about family planning.

Majority (77.4%) of the respondents had small farm size compared to medium (17.9%) and marginal (4.8%) farm size. None of the respondent belongs to landless and large farm categories.

Most (98.8%) of the respondents belonged to higher to medium income group as compared to low income (1.2%). Findings indicate that high income but low educational qualification group peoples were more engaged in Dyke vegetable production on gher to get additional income from there quickly.

Majority (89.3 %) of the respondents had no organizational participation as compared to low participation (10.7%). It is clear from the study that all the respondents who are involved in Dyke vegetable production had low organizational participation.

Most of the respondents (58.3%) were medium cosmopolite while 41.7% were high cosmopolite and there were no respondents of low cosmopoliteness. It means that almost every respondent were more or less cosmopolite.

Majority of the respondents (54.8%) had medium scale extension media contact followed by low scale extension media contact (45.2%). that means most of the respondents were more or less aware of the services provided by different extension agencies.

5.1.2 Prospects of Dyke vegetables production

Most (86.9%) of the respondent had medium to large sized of Dyke followed by small sized Dyke area (13.1%). that's why respondents can brought their Dyke area under vegetables cultivation in order to get additional incomes from there instead of remains fallow year after year.

Most (82.8%) of the respondents belonged medium to high yield group as compared to lower (17.9%) yield group. If respondent utilize their fallow Dyke area can definitely get additional production for selling in local market as well as family consumption.

Most (83.4%) of the respondents were in the category of medium to high income followed by low income (16.7%).It means that maximum medium income obtained from Dyke vegetable

farming with low cost technology. So in this areas having a lot of scope for earning income through judicious use of Dyke for production of vegetables on gher.

All (100%) of the respondents used gher water for irrigation in Dyke vegetable cultivation.

It is a no cost input methods for Dyke vegetable cultivation.

Most (92.85%) of the respondents grown cucumber and bitter gourd in the Dyke followed bottle gourd (47.61%) and tomato (36.90%). This might be due to the high price of those vegetables. By consuming that fresh vegetable the nutritional status as well as livelihood status of farmer's family will also be improved in this way.

Comparison between present and previous amount of land used in Dyke vegetable farming, the amount of small and medium size Dyke area in gher reduces compared with large Dyke area due to low production that is not sufficient to continue gher farming. But the farmers who have large sized Dyke in gher continued due to high quantity of profit. Usually the Dyke remains empty and not used for any production purpose. If the fallow dykes are brought under vegetable cultivation by using improved methods, the shrimp farmers will definitely have an additional income from that grown vegetables.

Majority (51.19%) of the respondents grown Lady's finger in the Dyke during followed brinjal (48.81%) and tomato (47.61%) during lean period. In that time vegetables scarcity found in market as well as farmer's field due to low vegetable production. If the fallow dykes are brought under vegetable cultivation by using improved methods .Farmers will ensure the availability of vegetables in market and also ensures their family nutrition.

The women of the study are not involved in Dyke vegetables cultivation due to social as well as religious barriers. Usually women are habituated to cultivate vegetables in their homestead

area. The capacity will be build up by utilizing them in Dyke vegetable production in ghera where they can access easily.

5.1.3 Problem confrontation

The respondents of the study area confronted more or less 30 problems related to Dyke vegetable farming with different extent of severity. The most severe problem in Dyke vegetable farming in the study area was lack of technical knowledge for identification of Diseases was the highly severe problem while Unavailability of fertilizer in season was the least severe problem. The other major problems were lack of technical knowledge for identification of Insects, high percentage of insect attack, fertilizer enhance insect attack, rats attack. All of the respondents faced medium to low problem confrontation.

Among 11 selected characteristics of the respondent's only annual family income showed a significant positive relationship and extension contact showed a negative significant relationship with the problem confrontation. The rest characteristics did not show any significant relationships with their problem confrontation.



5.2 Conclusions

Based on result and its logical interpretation the following conclusion may be drawn:

Majority of the respondents were young to middle aged farmers had primary level of educational qualification followed by illiterate, high experienced in farming and fish farming but low in Dyke vegetable production, small sized family, small farm size, high annual income, low organization participation, medium cosmopoliteness and medium extension media contact .

Most of the respondent had medium sized of Dyke area, medium yield and income from Dyke vegetable production and high irrigation facilitation for Dyke vegetable production, high family nutrition obtained from Dyke grown vegetables and ensuring food security by cultivating Dyke vegetables production in the study area.

The respondents of the study area confronted more or less 30 problems related to Dyke vegetable production with different extent of severity. The most severe problem in Dyke vegetable farming in the study area was lack of technical knowledge for identification of Diseases was the highly severe problem while Unavailability of fertilizer in season was the least severe problem. Among 11 selected characteristics of the respondent's only annual family income showed a significant positive relationship and extension contact showed a negative significant relationship with the problem confrontation.

Compared with many farming technology, Dyke vegetable production is low lost technology which saves farmers time, allowing them to undertake double benefit from Dyke on gher. There are a lot of gher so, Dyke based vegetable production practice may be one of the significant, efficient and viable option for small and marginal farmers. The Dyke cropping

helps to maximize land use, promoting food security and reducing dependency on Shrimps farming in South-western coastal region of Bangladesh.

5.3 Recommendations for Further Studies

The present study was conducted in five selected villages named Kahalpur at Atjuri union, joydihi, Munijela and Shawnbspur at Kotalia union and Charkulia at Kulia union of Mollarhat upazila under Bagerhat district of Bangladesh. Similar Survey should be conducted in other parts of the country where Dyke vegetable production are widely practiced to identify its prospects.

Research should be conducted as a guideline for the policy makers and extension planners to make policies and strategies for better utilization of gher of fresh or saline water areas of the country.

Research helps the farmers of areas similar to the study area to cope with climate change and ensure food security and supply of nutrition and enhanced in rural household.

The present study can provide a modern technology on Dyke management through utilizing locally available natural resources for the farmers.

The present study can provides information to the farmers who want to practice Dyke vegetables production and also act as an adaptation technique of climate change impact.

CHAPTER VI

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APPENDIX I

ENGLISH VERSION OF THE INTERVIEW SCHEDULE

AGROTECHNOLOGY DISCIPLINE KHULNA UNIVERSITY KHULNA

PROSPECTS AND PROBLEM CONFRONTATION OF DYKE VEGETABLE PRODUCTION IN GHERS OF SOUTH-WESTERN COASTAL REGION OF BANGLADESH

Sample number-----

Date: // 2018

Part: A

Name Father's name

Village Union

Upazila District

(Please answer the following questions & put a tick mark (✓) whenever applicable)

1) Age of the respondent: ----- Years.

2) Educational Qualification:

Please mention your educational qualification

- a) Cannot read and write-----
- b) Can sign only -----
- c) ----- Class passed.

3) Main Occupation of the respondent -----

4) Subsidiary Occupation of the respondent-----

5) Experience in farming ----- year.

6) Experience in fish farming ----- year.

7) Experience in Dyke vegetables cultivation (with year of initiation): ----- year.

8) Family members:

Please mention the number of your family members -----

Sl. no.	Name of the family members	Sex	Age	Relationship with farmer	Years of schooling	Main occupation	Subsidiary occupation
01							
02							
03							
04							
05							
06							
07							
08							

9) Land ownership / Farm size:

Please furnish information about your lands according to use

Sl. No	Use of land	Area of land	
		Local unit	Hectare
01	Homestead		
02	Homestead vegetables/fruits		
03	All ghers/ponds or water bodies		
04	Dyke Area (Length * Width)		
05	Own land under own cultivation		
06	Land given to others on barga		
07	Land taken from others on barga		
08	Land given to others on lease		
09	Land taken from others on lease		
10	Others (specify)		
Total			

10) Family income (annual):

Please furnish information about your family income (annual) from different sources

Sl. No.	Sources of income	Amount of Taka
01	Agriculture (Field crops+ homestead Veg./fruits)	
02	Dyke Vegetables	
03	Aquaculture (shrimp and fish produced)	
04	Other fisheries(fish business, harvesting from river and canal)	
05	Livestock & Poultry	
06	Business (Farmer himself or household members)	
07	Service (Farmer himself or household members)	
08	Labor selling (Farmer himself or household members)	
09	Remittance(In country or abroad)	
10	Others (Please specify)	
Total		

11) Organizational participation:

Are you involved in any organization?

Yes-----.

No-----.

If yes, please mention the nature and duration of your participation in the following organizations.

Sl no	Name of organizations	Nature of participation (with duration)			
		Not at all	Ordinary member	Executive committee member	Executive Committee officer
01	Farmers cooperative committee				
02	Farmers field school				
03	School committee				
04	Mosque committee				
05	Madrashah committee				
06	Temple / Church committee				
07	NGO committee				
08	Union parishad				
09	Youth club				
10	Others				

12) Cosmopoliteness:

Please indicate the number of times you were visited the following places within the specified period:

Sl. No	Place of visit	Nature of visit			
		Frequently (3)	Occasionally (2)	Rarely (1)	Not at all (0)
01	Relative of other known persons located outside of your own village	5-6 times/month	3-4 times/month	1-2 times/month	0 times/month
02	Union parishad office	8-10 times/year	5-6 times/year	2-3 times/year	0 times/year
03	Own Upazila sadar	5-6 times/month	3-4 times/month	1-2 times/month	0 times/month
04	Own district sadar	4 times/year	3 times/year	1-2 times/year	0 times/year
05	Other district sadar	4 times/year	3 times/year	1-2 times/year	0 times/year
06	Capital city	3 times/year	2 times/year	1 times/year	0 times/year

13) Extension contact:

Please mention the extent of contact with the following media in respect of various information related to your farming

Sl no	Communication media	Regularly (3)	Occasionally (2)	Rarely (1)	Not at all (0)
01	Farmers Field School				
02	Sub Assistant Agri. Officer				
03	Upazila Agriculture Extension Officer(AEO)				
04	Upazila Agriculture Officer(UAO)				
05	Upazila Fisheries Officer				
06	Upazila Assistant Fisheries Officer				
07	Research Organization (BARI, BRRI, BFRI etc.)				
08	Related NGO				
09	Television				
10	Radio				
11	Neighborhood /Friends/ Relatives				
12	Agricultural related magazine, leaflet, poster, etc.				

4

1) Area (in Decimal) of the Dyke and ghers

Length of ghers (ft.)	Width (ft.) of ghers	Length of Dykes(ft.)	Width (ft.) of Dykes	Area of ghers (length x width)(Dec.)	Area of Dykes (length x width)(Dec.)
Total					

۷

3) Do you use pond water for irrigation facilitation in case of dyke vegetables farming?

No-----.

Do you use your dykes grown vegetables for family consumption? "Yes" or "No".
If "Yes" please give the following information

Sl. No	Name of the vegetables
01	Tomato
02	Cucumber
03	Bottle gourd
04	Sweet gourd
05	Bitter gourd
06	Brinjal
07	Cabbage
08	Papaya
09	Ribbed gourd
10	Others

5) Food Security

Present amount of land used under Dyke vegetable cultivation.....dace

Previous amount of land used under Dyke vegetable cultivation.....dace

Do you grown vegetables in lean period? "Yes" or "No".

If "Yes" please give the following information

Sl. No	Name of the vegetables
01	Tomato
02	Brinjal
03	Pea
04	Sweet gourd
05	Papaya
06	Lady s finger
07	Cucumber
08	Bitter gourd
09	Ribbed gourd
10	Others

7) Capacity Building through Women Empowerment by dyke vegetables farming

Does your any female members are participated in Dyke vegetables farming? "Yes" or "No".

If "Yes" please give the following information

Activities	Regularly (3)	Occasionally (2)	Rarely (1)	Not at all (0)
1) Preparatory Stage				
Land Preparation				
Tillage				
Entresol preparation				
2) Intercultural operation stage				
Fertilizer Application				
weeding				

Irrigation				
Insecticides and pesticides application				
Mulching				
3)Harvesting Stage followed by post harvest				
Marketing				
Processing				
Preservation				

Do your any female members get economic share from Dyke vegetables farming? “

Yes-----.

No-----.

Part C

Problem confrontation by the Farmers (Dyke vegetables production)

Sl. No.	Type of problem	Rate of problem			
		Highly severe (3)	Severe (2)	Less severe (1)	Not at all (0)
1	Unavailability of seed and/ seedlings				
2	High price of seed / seedlings				
3	Problem of seed germination				
4	Purity of seed				
5	Lack of knowledge for selecting appropriate vegetables				
6	Unavailability of fertilizer in season				
7	High demand and high price of Fertilizer				
8	Lack of good quality fertilizer				
9	Lack of knowledge of balanced fertilizer				
10	Fertilizer enhance insect attack				
11	Lack of technical knowledge of Fertilizer application				
12	Deficiency of irrigation water in season				
13	Contamination of salinity in irrigation water				
14	High percentage of insect attack				
15	High percentage of diseases				
16	High price of insecticide or pesticide				
17	Lack of technical knowledge for identification of Insects				
18	Lack of technical knowledge for identification of Diseases				
19	Poor productivity				
20	Low market price in respect of production cost				
21	Lack of marketing facilities				
22	Lack of preservation facilities				

