UNDERSTANDING THE IMPACT OF 4G IN AGRICULTURE SECTOR OF BANGLADESH

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APPROVAL

This Research titled **"Understanding the Impact of 4G in Agriculture Sector of Bangladesh"**, submitted by **Md. Nazrul Islam Id: 143-15-4480 and Md. Rashel Uzzaman Id: 143-15-4573** to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents.
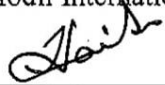
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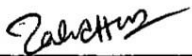Faculty of Science & Information Technology
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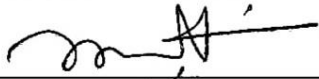Daffodil International University

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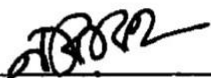Daffodil International University

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DECLARATION

We hereby declare that, this research has been done by us under the supervision of **Narayan Ranjan Chakraborty, Assistant Professor, Department of CSE** Daffodil International University. We also declare that neither this research nor any part of this research has been submitted elsewhere for award of any degree or diploma.
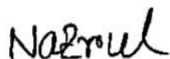
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ABSTRACT

Recently fourth generation (4G) launched in Bangladesh. It has many impacts on our daily life such as day to day communication, economy, technology etc. This research will investigate the impacts of 4G in the agriculture sector of Bangladesh. Bangladeshi farmers are not very aware of the Internet and mobile application. Because of this, they do not get proper information timely and most of the time struggle to get the appropriate solution for their different farming problems. In this study, we have collected interview data of the farmers of two different districts. We analysed the data using manual coding techniques. The result shows that the way the government providing the agricultural support to the farmers is not properly technology supported, on the other hand, the farmers are not so familiar with the Internet, smartphone and mobile applications. To minimise this gaps we have formulated a few guidelines for both farmers and government officials. The result of our study will help the farmers, in the long run, to improve their farming through technological support.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

4G is the fourth generation of mobile phone technology. We currently live in the era of 4G technology. For this we can use high speed internet access. The main application that 4G could make available that 3G in general did not, or could not. Already 4G had many impact in our daily life communication, economy, technology etc. The fourth generation of mobile communication technology, has spread around the world. Bangladesh has started the new technology journey on February 19, 2018. This research will focus on getting objective information through this technology and to create a generation that can contribute to the development of economic activities. Here we focus on Agricultural impact. Bangladesh is a primarily agricultural economy. It is the largest productive sector of agricultural economy, because it employs almost 30% of the GDP of the country and about 60% of the total labor force. The effect of this sector on the major macroeconomic goals such as employment generation, poverty alleviation, human resources development, and food security is much more impressive. Now a day's 98% of Bangladeshi population use mobile phone [05]. Mobile communication technology has become the world's most common way to send voice, data, and services to the developing world. In order to connect farmers and service providers, the mobile phone can play an important role. This dramatic change, the general application of mobile and mobile applications for agricultural and rural development, particularly significant feasibility for the development of progress. Mobile Application provide the most affordable ways for millions of people to access information, markets, finance, and governance systems available to them. The agricultural apps focus on improving agriculture supply chain integration and have a wide range of functions, such as providing market information, insect information, weather information, increasing access to extension services, and facilitating market links. The Bangladesh government as well as the private sector concentrate on developing easily accessible mobile applications to help farmers. We want to learn how impact is fall on agricultural.

1.2 Motivation

In the last ten years, a decade of Information Communication Technology (ICT) has increased in Bangladesh .They build many agricultural website and application, where agricultural information is store. Mobile user and internet user are increasing day by day. By using mobile phone farmers can access those information through internet and agricultural mobile application. They can get weather information, price information, production and cultivation technique, plant nutrients and water usage, education and health information, govt. and non govt. facilities, demand and current stock information, diseases and insect information. The Bangladesh government and other private sector concentrate on developing easily accessible mobile applications to help farmers. Already we have more than 50 agricultural mobile application. Using mobile application farmers can easily find any solution of their farming problem. Mobile application is increasing day by day. Our main focus is does the people use it properly and does they face any problem when they use it.

1.3 Rationale of the Study

We study in Computer Science since 4 years. After the study we know the technology behind every application and website. Now we want to know how people use it. Whether the computer science engineer are just design and developing apps and website. Is it applicable for people or not. Does they use it properly? Rationale of the study is to find the reason why the farmer is not use internet and agricultural application.

1.4 Research Questions

Mobile technology and application has many impact in our daily lives. Now the question is why the awareness of using technology in farming sector is low? Despite the many benefits, why the use of agricultural mobile applications is very low? Why they are not concern use internet and what kind of problem they face?

1.5 Expected Output

Most of the farmers are live in rural area. The communication is not good in rural area. They suffer many problem in farming. After finishing the study we hope we may know

- ❖ How to do if they face problem in cultivate crops
- ❖ Where they get solution
- ❖ About their lacking
- ❖ Does they use internet and agricultural mobile application
- ❖ Does they get benefit from it? Does they get their objective information
- ❖ Does they face problem using internet

1.6 Report Layout

In the chapter 1 we have discussed about the introduction, motivation of the work, objectives and expected outcome of the research work and the report layout. In the chapter 2 we discussed about the background study of our work. We also delivered the related works, research summery and scope of the problem and challenges of this research. The chapter 3 is all about the research subject and instrumentation, case study, data collection procedure, statistical analysis and implementation requirement. In the chapter 4 is all about experimental results, descriptive analysis, finding solution and summary. In the chapter 5 contains the conclusion part and the summary of the study, recommendations and implication for further study.

CHAPTER 2

BACKGROUND

2.1 Introduction

2.1.1 Fourth Generation (4G)

4G (Fourth Generation) technology refer to or short name of fourth Generation which was started from late 2000s. The fourth generation mobile communication system is developed after the third generation (3G) mobile phone standards. 1G based on analog signal and 2G based on digital and 3G support multimedia access [10]. A fourth generation system (4G) provides various features which are not involved in Third generation standards or any other generation before 3G. Table 2.1 present the application of 4G. 4G standard very fast and reliable as compare to 3G network. 4G communication is very fast and reliable and unique. 4G is designed to provide high speed, high capacity, low cost per bit, and is an IP based services for video, data and voice .The fourth generation of mobile communication technology, has spread around the world. In March 2008, the International Telecommunications Union-Radio communications sector (ITU-R) specified a set of requirements for 4G standards, named the International Mobile Telecommunications Advanced (IMT-Advanced) specification, setting peak speed requirements for 4G service at 100 megabits per second (Mbit/s) for high mobility communication and 1 gigabit per second (Gbit/s) for low mobility communication . 4G technologies domain include mainly three major technologies, .i.e., LTE, HSPA+ and WiMAX [11]. Table 2.1 shows a comparison of the 4G candidate systems .

Table 2.1: Comparison of the 4G Candidate Systems.

	HSPA+	WiMAX	LTE
Family	3GPP	802.16m	3GPP
Primary Use	Used in 4G	Wireless MAN	General 4G
Radio Tech	CDMA/ FDD MIMO	MIMO-SOFDMA	OFDMA/ MIMO/ SC-FDMA
Downstream (Mbit/s)	21 42 84 672	2x2 MIMO 110 (20 MHz TDD) 183 (2x20 MHz FDD) 4x4 MIMO 219 (20 MHz TDD) 365 (2x20 MHz FDD)	100 Cat3 150 Cat4 300 Cat5 (in 20 MHz FDD
Upstream (Mbit/s)	5.8 11.5 22 168	2x2 MIMO 70 (20 MHz TDD) 188 (2x20 MHzFDD) 4x4 MIMO 140 (20 MHz TDD) 376 (2x20 MHzFDD	50 Cat3/4 75 Cat5 (in 20 MHz FDD)

4G developed to provide secure broadband access for mobile devices such as smartphones, laptops, net books, wireless modems and other electronic devices requiring IP based broadband access.

4G has high speed internet. A country's 4G speed is can depend on many factors i.e.

1. How much spectrum is devoted to LTE?

2. Whether it has adopted new 4G technologies like LTE Advanced

3. How densely networks are built and how much congestion is on those networks.

In general, though, the countries with the fastest speeds tend to be the ones that have built LTE-Advanced networks and have a large proportion of LTE-Advanced capable devices. Table 2.2 show the top 15 countries average download connection speed [20].

Table 2.2: Top 15 Countries Average download Connection Speed

Countries	Speed
Singapore	44.31 Mbps
Netherland	42.12 Mbps
Norway	41.20 Mbps
South Korea	40.44 Mbps
Hungary	39.18Mbps
Belgium	36.13Mbps
Australia	36.08Mbps
New Zealand	33.52Mbps
Bulgaria	33.34Mbps
Canada	33.90Mbps
Denmark	33.09Mbps
Serbia	32.22Mbps
Croatia	32.21Mbps
Spain	31.08Mbps
Lithuania	30.78Mbps

2.1.2 4G IN BANGLADESH

Bangladesh launch of fourth-generation (4G) mobile internet on February 19, 2018. Mobile phone operators- Grameenphone, Robi, Banglalink and state-run Teletalk- have received 4G licenses from Bangladesh Telecommunication Regulatory Commission (BTRC). State-owned mobile network operator (MNO) Teletalk will start offering 4G service in August this year although three private MNOs launched this service in February last.

BTRC had put up 46.4 Megahertz (MHz) of spectrum for sales in the auction, but only two operators collected 15.6 MHz while two others kept aside from the vie. Banglalink bought 10.6

MHz spectrum 5 MHz in 2100 band and 5.6 MHz in 1800 band while Grameenphone took 5 MHz from only in 1800 band.

After the auction, now the Grameenphone has totaled 37 MHz of which 7.4 MHz in 900 band, 15.6 MHz in 1800 band and 10 MHz in 2100 band to serve 68.594A million subscribers while Banglalink owns a totaled 30.6 MHz -- 5 MHz in 900 band, 15.6 MHz in 1800 MHz and 10 MHz in 2100 band to serve 33.346 million customers.

Robi which merged with Airtel has totaled 36.4 MHz spectrum in three different bands—9 MHz in 900 band, 17.4 MHz in 1800 band and 10 MHz in 2100 band to serve 45.029 million customers. Besides, Teletalk has totaled 25.2 MHz of which 5.2 MHz in 900 band, 10 MHz in 1800 band and 10 MHz in 2100 band to serve 3.757 million subscribers.The total number of Mobile Phone subscribers has reached 150.727 Million at the end of May, 2018 and the total number of Internet Subscribers has reached 86.872 Million at the end of May, 2018 [22]. The average internet speed of mobile operators in Bangladesh is the lowest among the neighbouring South Asian countries. The speed is 10 mbps in those countries except India and Bangladesh has 5 mbps. Weak infrastructure in rural areas is one of the major reasons for slow internet connection in Bangladesh [25].

2.1.3 Bangladesh Agriculture

Agriculture is the biggest employment sector in Bangladesh. The effect of this sector on the major macroeconomic goals such as employment generation, poverty alleviation, human resources development, and food security is much more impressive. Although rice and jute are the primary crops, wheat is assuming greater importance. Tea is grown in the northeast. Because of Bangladesh's fertile soil and normally ample water supply, rice can be grown and harvested three times a year in many areas. Table 2.3 present the agriculture status of Bangladesh   .A plurality of Bangladeshis earn their living from agriculture. GDP from Agriculture in Bangladesh increased to 10117.30 BDT Million in 2017 from 9922.80 BDT Million in 2016. The GDP from Agriculture increasing day by day.

Table 2.3: Bangladesh Agriculture at a Glance

Total Family	2,86,95,763
Total Farm Holding	1,51,83,183
Total Cultivable land	85,60,964.75 hectare
Total Irrigated Land	74,06,822.87 hectare
Cultivable waste	2,10,027.92 hectare
Cropping intensity	192%
Single cropped area	23,54,821.74 hectare
Double cropped area	38,47,274.49 hectare
Triple cropped area	17,15,430.38 hectare
Net cropped area	79,30,071.63 hectare
Total cropped area	1,52,45841.93 hectare
Contribution of Agriculture sector to GDP	14.75%
Total food crop production	Rice-347.101 lakh mt wheat-13.48 lakh mt Maize-27.59 lakh mt

2.1.3.1 e-Agriculture Context in Bangladesh

Bangladesh has stepped into new era of Digital World with a viewable vision of "Digital Bangladesh". Towards that end, e-Agriculture has been given one of the topmost priorities by the government. The areas which taken place in e-Agriculture is given below [29].

- ❖ Areas which taken place in e-Agriculture
- ❖ Web-based agriculture information
- ❖ Connecting farmers with specialists
- ❖ Radio and TV
- ❖ Call centres
- ❖ Audio-visual content

- ❖ Targeted mass dissemination of agriculture information
- ❖ Locally based information centres

2.1.4 Agricultural Mobile Application

Mobile Application provide the most affordable ways for millions of people to access information, markets, finance, and governance systems available to them. The agricultural apps focus on improving agriculture supply chain integration and have a wide range of functions, such as providing market information, insect information , weather information ,increasing access to extension services, and facilitating market links . For helping farmers the government of Bangladesh and many others private sector are focus development Agricultural Application. Using those technology farmer can get information about weather information, price information, production and cultivation techniques, plant nutrients and water usage, Education and Health information, Govt. and non govt facilities, Demand and current stock information, diseases and insect information [23]. Table 2.4 present some govt. Agricultural Mobile Application .Using mobile applications Information are available at home, the sufferings of the farmers will be reduced. Advanced technology will expand in agriculture and many other facilities. Governmental agricultural mobile application is given bellow [24].

Table 2.4: Some Agricultural Mobile Application

No	Application Name	What Service Provide?
1	Rice Knowledge Bank (RKB) Mobile Apps	This app provide detailed information on modern technology of rice cultivation. Besides, information on different types of paddy, their cultivation process, fertilizer management, disease management, seed production, and crops marketing etc.
2	Krishoker Janala	Plants problem of farmer's windows or digital identification system farmers to solve many problems quickly and effectively in a digital effort. It has built up Crop based many problems logically arranged. The picture at the farmer himself can identify the problem and solve the problems identified by clicking on the

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		image will appear on the monitor. The field crops, vegetables, fruits and other plant pests, insects, or other reasons, the problem is the shortage of fertilizer; The problem and its solution has been added. Add at least one representative of each problem and has multiple images; So that farmers can easily identify the problem. Here are more than 120 different crops in 1000 as a solution.
3	Farmer's Digital Address	Farmer's Digital Address is the agricultural based web portals and Mobile Application. Here are more than 115 different crops, Pest Suppression, Disease suppression, Modern technology of crop cultivation, Fertilizer determination method through auto calculator, Crop nutrition and weed management and many other agricultural information
4	Pesticide Prescriber	This application page helps farmer to find the name of appropriate pesticide with correct dosage against a particular pest of crop instantly.
5	Vegetables Cultivation in Floating Method	This application contains a wide variety of ways for the cultivation of vegetables, especially lowland vegetables that can live easily in the lowlands.
6	Krishikotha	Monthly Agriculture Bangla Magazine Krishikotha
7	দু'টি পাতা একটি কুঁড়ি	Tea's statistics, information technology and e-data repositories, online or offline due to lack of information and technical issues in a variety of tea and tea-related personnel in remote areas find solutions Tea Board, pidiiu and BTRI to come to the office. The "two leaves and a bud 'called for the creation of mobile apps and apps to create a database of all the information Statistics tea and tea at the inclusion of the history, CIT and tea industry, tea farming practices, soil management.

2.2 Related Works

Using a combination of 4G wireless and satellite technology SATELLITE communications company Pivotel create a new network solution for Australian agricultural industry. The new product known as ecoSphere . It works by using solar and battery powered 4G base stations connected to sensors and tracking 4G and satellite information across an entire farming operation. The ecoSphere system allows farmers to access long range connectivity to video, data and remote monitoring of assets and employees, all over a private network [7].

Focus ICT on the agriculture sector they make a survey does the farmers use ICT tools on agriculture. That survey were took place in Gazipur district in Bangladesh. From there survey result Television was took the 1st position and mobile phone was 2nd internet was 3rd. But the point is farmers use most of the time television on other purpose. They focus to develop in Mobile and internet [31]. Focus on agriculture development by using ICT tools they describe the necessity aware the farmers and they discus many facilities of using ICT tools [32].

2.3 Research Summary

For this research we visit two districts in Bangladesh and talk with the farmers and took their interview. We record those interview for our data analysis. We try to find out the core problem and discus its solution. Most of farmers are use smart phone but majority doesn't know about agricultural application.

2.4 Scope of the Problem

Why we focus on Agriculture. Because Agriculture is the major part of our economy. Major part of GDP comes from agriculture. Our Government and many other NGO focus on this sector and takes many steps for developing this sector. They build many mobile application, e-service and web portal for helping the farmer's. We are in the era of 4G technology and we have high speed internet. Our aim is to find out that does the farmers get benefit from those steps.

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2.5 Challenges

To complete our study we face some challenges. The main challenge was selecting proper farmers. Who use internet on his farming. We wanted to select a farmer who understood about mobile technology and mobile application. We had to work hard for this selection. Farmers were filling embarrassed on interview recording. We ask them in their regional language for their understanding.

CHAPTER 3

RESRARCH METHODOLOGY

3.1 Introduction

Bangladesh is a developing countries. The population of this country approximately 166 million. It is primarily agricultural economy. The study was carried out in two district viz. Jamalpur and Kushtia. Jamalpur is a district in Bangladesh part of the Mymensingh Division. It was established in 1978. .Jamalpur occupies 2031.98 km². It is located between 24°34' and 25°26' north and between 89°40' and 90°12' east. It shares an international border with the Indian state of Meghalayain the North East. It is surrounded by Kurigram and Sherpur districts in the North, Tangail district in the South, Mymensingh and Sherpur districts in the East, Jamuna River, Bogra, Sirajganj and Gaibandha districts in the West. The district has a population of 2,292,674 of which 50.8% are female and 49.2% are male [27]. About 65% of the population is related with Agriculture. Literacy rate 38.4%. The main crops are Paddy, Potato, Jute, Eggplant, Pepper, Mustard, wheat, Vegetables etc.

Kushtia is a district in the Khulna administrative division of western Bangladesh. Kushtia District has an area of 1608.80 square kilometres and is bounded by Rajshahi, Natore, Pabna districts to the North, by Chuadanga, Jhenaidah districts to the South, by Rajbari District to the East, and by West Bengal and Meherpur District to the West. Kushtia District has a population of 1,946,838, of which 50.86% are male and 49.14% female [28]. Literacy rate 40.4 %. About 51.7% of the population is related with Agriculture. The main crops are rice, wheat, jute, sugar, potatoes, and tobacco.

3.2 Research Subject and Instrumentation

Our research subject is 4G in Bangladesh and its impact on Bangladesh agriculture. Our research instrumentation is the recorded interview that we collect from the farmers.

3.3 Data Collection Procedure

The purpose of this research was to obtain real-life experience in real situations. For this research we collect data on two way. 1st of all we need to achieve knowledge about technical details and

government's benefits for farmers. For achieve the knowledge we study many research paper on 4G technology and visit many web sites and gather knowledge about 4G . We collect information from those papers and web search. 2nd we collect information by real-life situation. For that we need to go the rural area and we talk with farmers and gather knowledge about their straggle. Data was collected by conducting interviews with farmers. In total 25 interviews were done. The language for all interviews were Bengali. All the interviews were recorded. The interview were open and semi structured and took consent of the participants while recording the interview. The length of the interview varies between 2 and 4 minutes. Our interview focused on their farming activities, knowledge about mobile technology, agricultural mobile application and the coordination process in their own. We told them about the interview and what type of question before the interview. For the reason is the farmers can easily face the interview. Focusing the farmer's understand we make the interview question on easy word. We try to ask them on their local language.

3.4 Statistical Analysis

We analysis our data. We look into the following questions: Do they use mobile phone and what kind of phone? How about mobile network? Do they use Agricultural mobile application? Do they use internet? Do they use mobile internet to get agricultural information? How to fix if there is any disease in crops? Do they hear the government of Bangladesh launched the 4G Mobile technology? We took total 25 interview. We analyses the data using manual coding techniques .The smart phone user no is 24 and another one use normal phone. Internet user 23 and agriculture application user only 4. Without using Internet 3 agriculture information gather by mobile phone. Using internet but doesn't use agriculture application 19. In percentage the smart phone user 96% and remaining 4% use normal phone. 92% farmers are use internet and 52% use internet on agriculture purpose and remaining 48% use internet on other purpose. Among them 16% use Agricultural application and majority are not hear the agriculture application. The ratio of agriculture app user is very poor. 96% farmer are use smart-phone but 16% farmer use agriculture application. Most of the farmers have no idea about agricultural apps.   Table 3.1 show the result of our study.

Table 3.1: Statistical Result

	No.	%
Total	25	
Smart phone user	24	96%
Normal phone user	1	4%
Internet user	23	92%
Agricultural Application user	4	16%
Using internet But doesn't use agriculture application	19	84%
Using internet get agricultural information	13	52%
Internet use on other purpose	12	48%
Without using internet get agriculture information by using mobile phone	3	12%
Use mobile phone get agriculture information（they also use internet）	16	64%

3.5 Implementation Requirements

From our study we see that they have lack of ICT knowledge. Most of the farmer use smart phone but they doesn't know how to use internet and agricultural application. Most of time they use internet on other purpose. They need proper training on ICT tools. If they apply the technology on their work then it will be helpful for them.

CHAPTER 4

EXPERIMENTAL RESULT AND DISCUSSION

4.1 Introduction

To get the final result, we need data. Then we collect data from the interview. After pre-processing of data we analysis and find the expected outcome

4.2 Experimental Results

From the study we find how the farmers get knowledge about agriculture. Every farmer's doesn't have smart phone and doesn't know about agriculture application. But they also collect information.
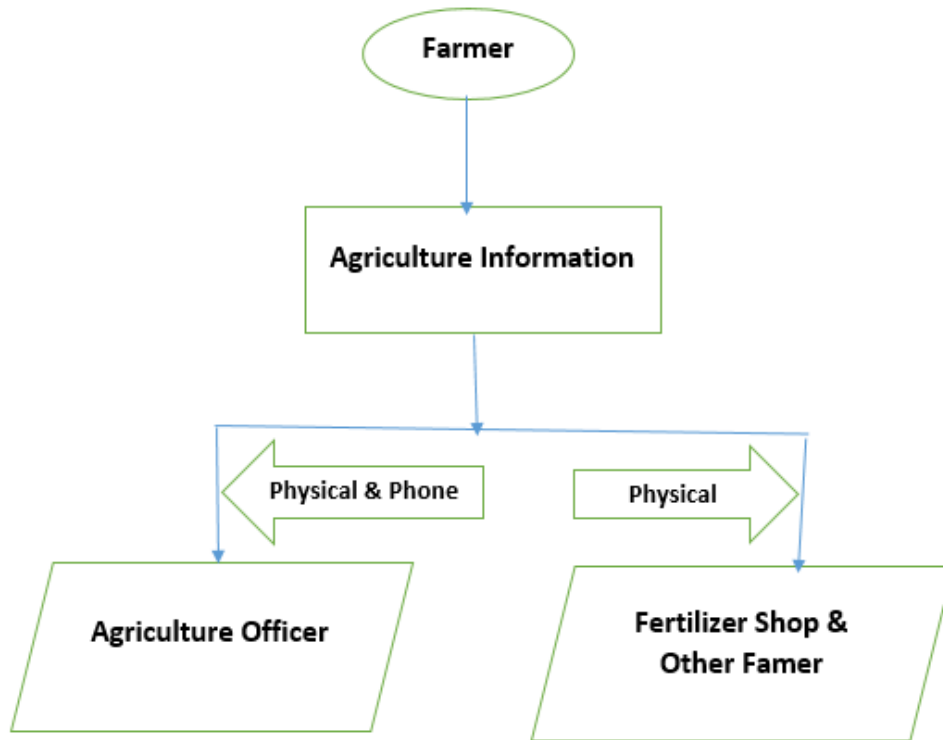

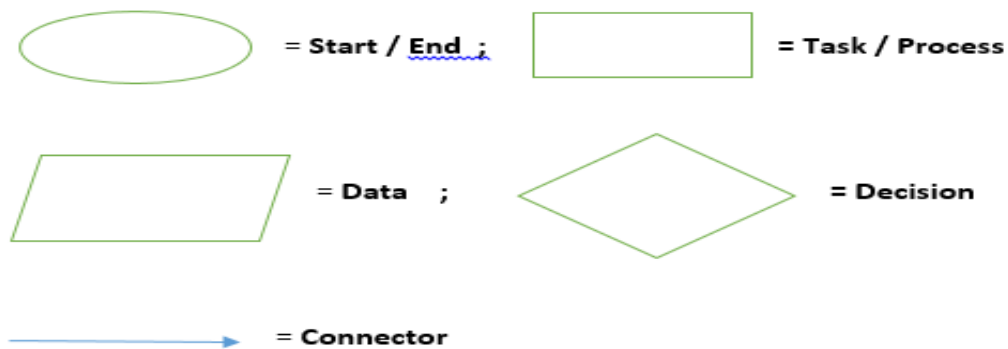Figure 4.1: The scenario those farmer who use smart phone

Figure 4.1 present the scenario those farmer who use smart phone or not and cultivate field on traditional way. They are not use agricultural mobile application .If he face any problem on cultivate he get information from other farmer and fertilizer shops. Very little time they contact with agriculture-officer but some time it is difficult for those farmer who lived in rural area. Most of time they can't get information timely. Some time they cannot correctly find out the problem. On that case they cannot told their problem clearly though mobile phone. Sometimes the mobile network is not good in rural area. Figure 4.2 present the scenario those farmer who have use smart phone and also use agricultural mobile application. They also use internet for their work. That's why they can get information so timely and when they face any problem they instant get the solution. They solve their problem instant and also help the other farmer. They also find information through web browser. They sometimes takes picture and send to the agriculture officer. They also connect with agriculture officer. But the ratio of this famers are very low. Most of farmers are not concern about technology.
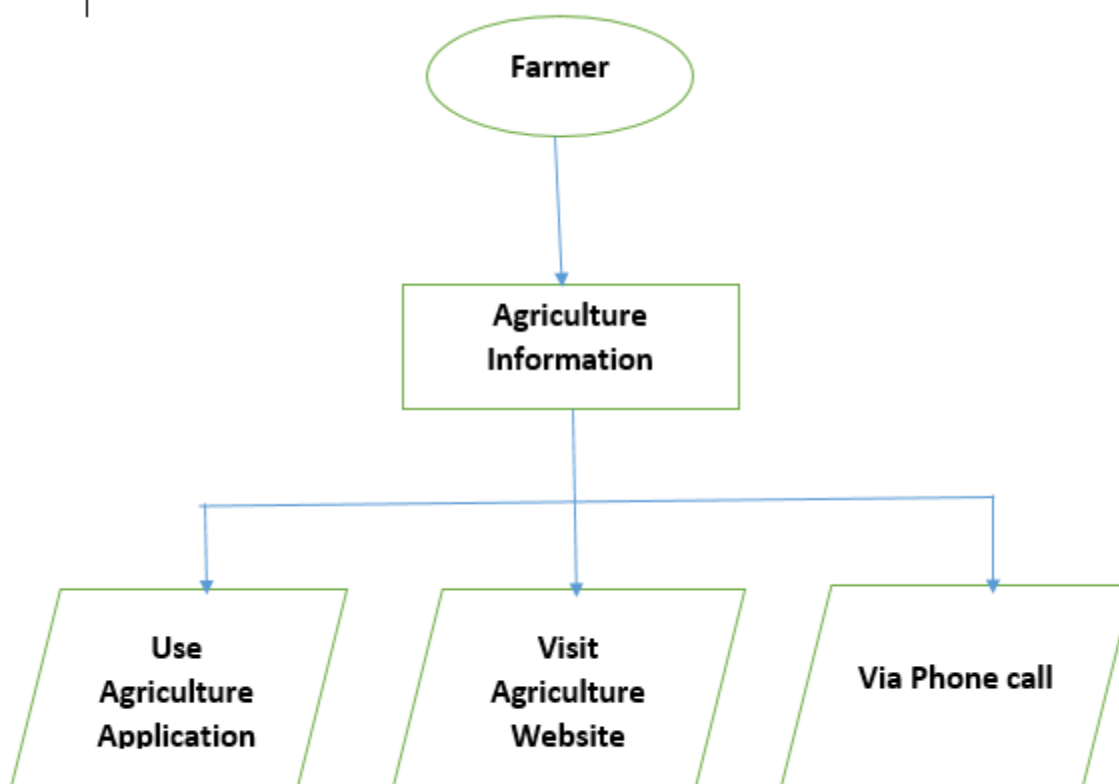
Figure 4.2: Use smart phone and agricultural mobile application

Figure 4.3 show the overall scenario how the farmers get agricultural information. The scenario present that those farmer who have not smart phone, they find there solution by physical way viz. go to the agricultural office, other farmers and fertilizer shops. They have to do a lot of trouble to solve the problem. On the other hand those farmer use technology they easily find the solution. When they face any problem they use apps and internet portal. From our study we see that why the farmers are not use technology, we find out those case. The farmers were facing many problems, obstacles and challenge in the use of internet. There are many challenges were indicated such as organizational, technical, financial social and illiteracy. Figure 4.4 present the obstacles and challenges whey farmer doesn't use internet and agricultural mobile application.
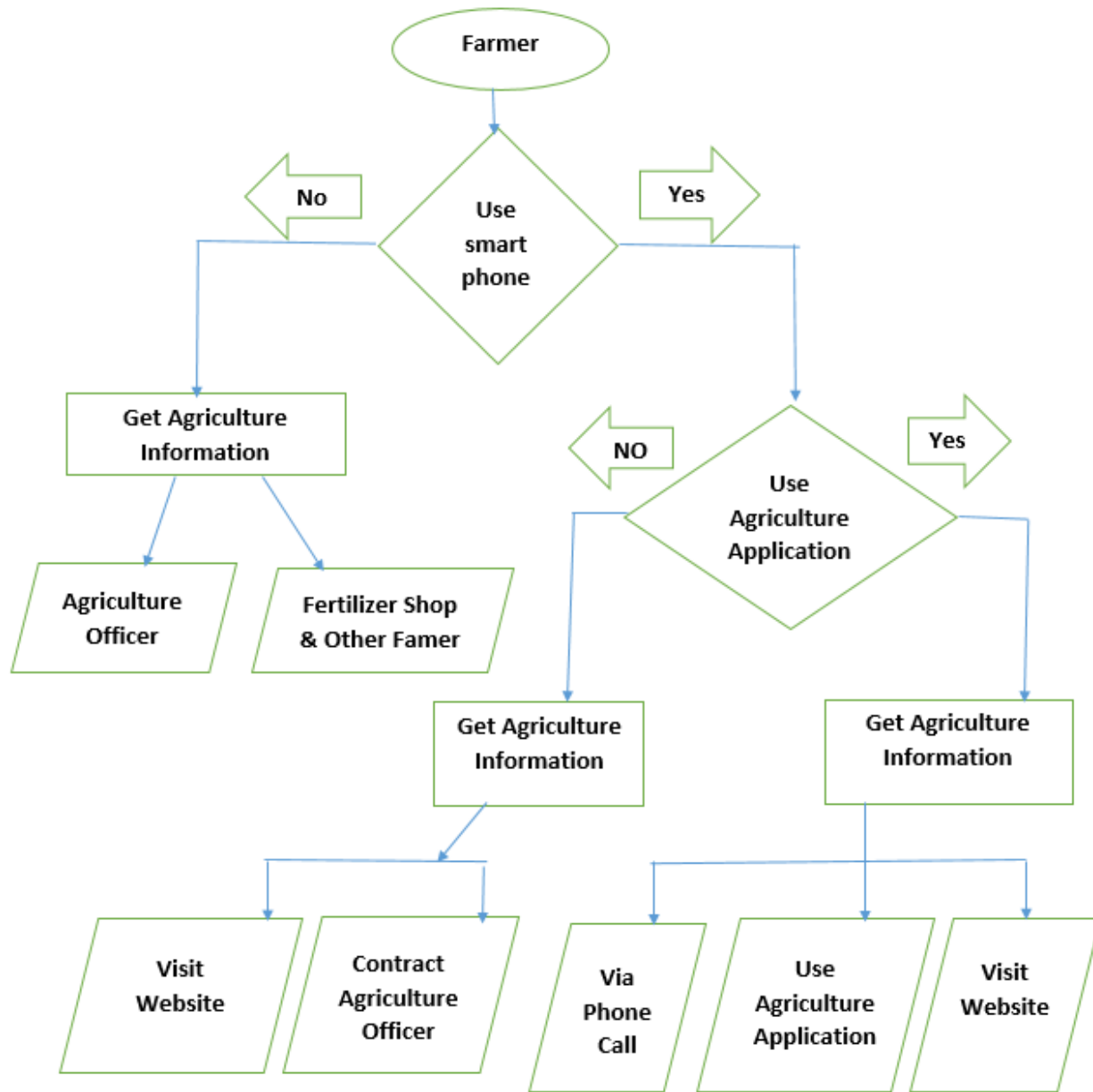
Figure 4.3: The overall scenario how the get agricultural information

Technical problem

Most of the farmers live in rural area. The development in rural area is not good. .They are not familiar with the new technology. If there is a new technology, it takes a lot of time to reach the village. They face many technical problem viz. the network speed in the rural area is not good, awareness of using technology is very poor, they doesn't know the benefits of using technology. The mobile network is good in city but it is not good at out of town. In the rural area they cannot get properly 2G and 3G.

Organizational

Sometimes they are misguide by many thing. The awareness of ICT is very poor among the farmers. Lack of training and workshop on how to use internet and Agriculture application. Lack of proper training.

Financial and Social

Financial is one of the major problem. To use internet and agriculture apps they need a smart phone. Use internet they need to buy internet package. But the cost rate is not familiar with them. Sometimes Mobile operators give many offer but the expiry is so low. Due to the low expiration and low internet speed they can't proper use of that package. The rural social life is very challenge, there is no right person who help them properly to understanding technology. If someone shows interest but he doesn't success because of his position and social condition.
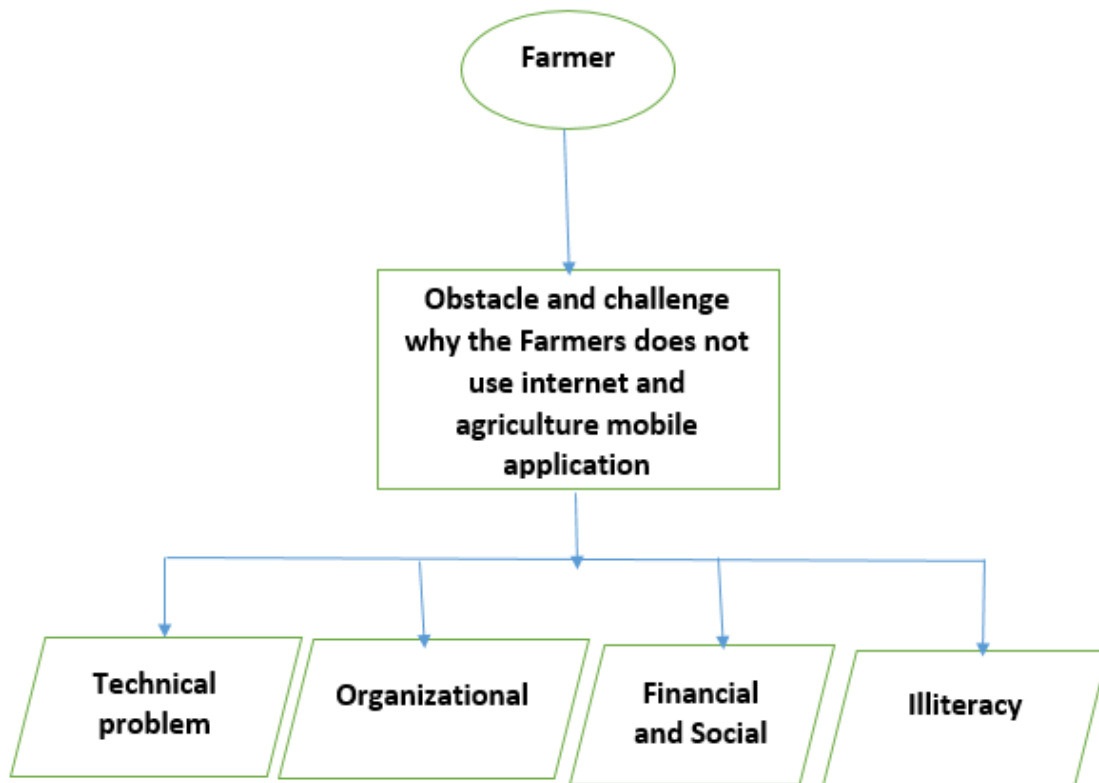

Figure 4.4: Problem of using Technology

Illiteracy

Illiteracy is one of the common problem. Most of farmer are not proper educated. Being illiterate, they are lagging behind in all directions. They do not understand how it would be better

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to do. They can't read and write a message. They do not know what is internet and how it use to find out agriculture information. They doesn't know how to up apps, how find out any solution from internet.

4.3 Descriptive Analysis

The purpose of this study was to explore the answers to research questions why the farmers are not using technology? They use smart phone but they do not know about agricultural application, why? Why they do not use internet? Why they do not know about government facilities?

In exploring the answers to the questions, we went to field and talk with the farmers, we want try to know about their problems and find out the questions answer. It is clear from this research that most of farmer have no idea about agricultural mobile application. There is no campaign on this. Although the little amount of farmer know it but they doesn't use it properly. They buy internet package but is has lo expire. Cost also not friendly. Due to the low speed internet they can't use internet properly. Most of farmer did not know about Government agriculture website, some farmers know but they does not know how to use it, how they submit their problem etc...

In the rural farmers they are not well educated majority are illiterate. That's why they can't understand what they should do. They have many lack of ICT knowledge. Rarely they go to the agricultural officer, most of time they collect information from other farmers and fertilizer shop. That's why they doesn't know about government's steps on agriculture and what's the new benefit coming for them. Majority doesn't know about call-center and what's its function.

Development on agriculture sector Bangladesh government has taken many steps. Building Agriculture Mobile Application is one of the great step. Using agriculture app farmers can easily find out the problem and its solution. Already government had published many apps. For our research we went to field, we talk with farmers about their problem and many facilities. From our research we find out most of farmers does not know about agriculture apps although use smart phone. Besides building app government needs to focus to reach the farmers. Beside Government many NGO and non-Government Organization have built many mobile agricultural application but the awareness is very poor. They need to focuses on awareness to the farmer using agricultural mobile application. Figure 4.5 present a proposed system for agricultural communication.

Agricultural Officer

Agricultural Officer can easily reach the farmers because farmers are connected with them .They can easily awareness the farmers on using technology.

Media

The media provide people many benefits, and opportunities to empower themselves in a variety of ways. Government and Other Organization can use media viz. social media, TV, Radio etc... By publishing advertisement they can awareness to the farmers. Newspaper also can take many steps, most of people read newspaper regularly.

Organization

Many government and non-government organization who has worked with the farmers. Those employee who work on field they can talk farmers about the facilities of using application and technology.

Most of former say they are not happy with mobile networks. They say government lunched 4G but we don't get 2G and 3G. The main problem they face that is the network is not.
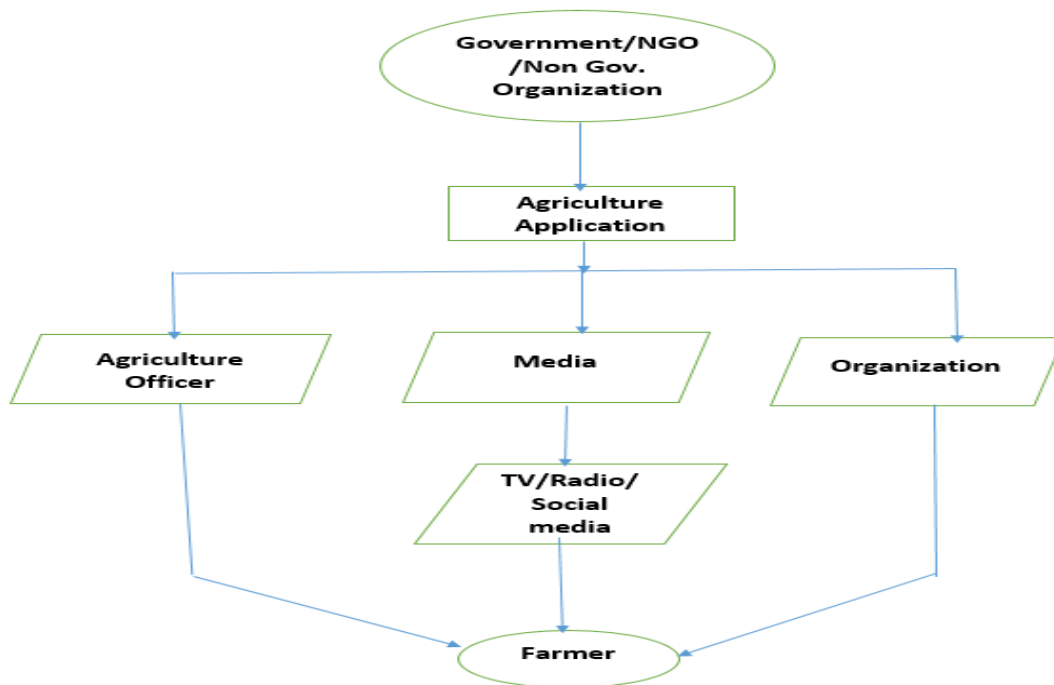

Figure 4.5: Proposed System for Agricultural Communication

4.4 Summary

After analysis the data we find some farmers who cultivate at traditional way. Those farmer never use internet and agricultural mobile application, and doesn't contact with agricultural officer. They get information from fertilizer shop and other farmer. And the other type of farmers are they use internet and mobile application on their work and also contact with agricultural officer. They face network speed problem, internet package are not friendly.

CHAPTER 5

SUMMARY, CONCLUSION, RECOMMENDATION AND IMPLICATION FOT FUTURE RESEARCH

5.1 Summary of the Study

Finding the research questions we went to the farmers and talk with their problem. We take their interview and record that. We analysis their interview and collect data for our research and we find our research question answer. And also find the obstacles and challenge. They face many problem.

5.2 Conclusions

The idea of this paper was to find out the impact of the mobile technology on agriculture. For this we went two district in Bangladesh. That's are Jamalpur and Kushtia. We talk with farmers and records there interview. We want to know that does they get any agricultural information by using mobile phone. From their interview we find out most of farmers are use smart phone. Among them most of the farmers use phone on other purpose. They did not have no idea about agricultural app, they doesn't know how they get information using internet. The farmers did not know about agricultural website and what are there. They use smartphone but they does not get any benefit from it. Although some farmer use internet but they say they face many problem that's are low internet speed, call drop, internet package is not friendly because expire is very low.

We try to find out why they face problem and flow diagram present the scenario of their condition by this paper. They doesn't get any benefit from new technology. They have lack of ICT knowledge. The mobile operators have to develop in rural area.

5.3 Recommendations

If the government take the necessary steps to aware the farmers about modern technology. Then it will bring a good for the farmers. Farmers need training on using technology. The mobile network is good in city but it is not good at out of town. The mobile should be developed in rural

area. Because the main part of our economy is in rural area. So beside government the private organization need to take step forward for the farmers.

5.4 Implication for Further Study

If the government and the private organization design and development their web portal and mobile application focus the rural area than the 1st work will be aware and training farmers. Then the farmers can understand about the convenience of the using technology on their farming and they will get the better service.

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APPENDICES

Appendix A: Research Reflection

The appendix of this research refection is it is enjoyable and challenging for a team work. We had to go to villages and farms to collect data which was very enjoyable and challenging for us. This research results would help them to their future cultivation if the government come forward and farmers show interest on modern technology.

Appendix B: Related Issues

Collecting data for this research from outside of Dhaka was very difficult. We had to go to villages and field for interview and data collection. We had to talk to the farmers and we try to understand them our subject and they were very friendly and cooperate with us.