

SUPPORTING WOMEN IN ICTs: A STEP TOWARD ACHIEVING E-GOVERNANCE IN BANGLADESH

Thesis submitted to the University of Dhaka in fulfillment of the
requirements for the award of the degree of

Masters of Philosophy

TASNUVA HABIB ZISAN
Registration no. 89
Session: 2011-2012
Department of Public Administration
University of Dhaka

Supervisor
Dr. SyedaLasnaKabir
Professor
Department of Public Administration
University of Dhaka

University of Dhaka



Department of Public Administration

Phone : PABX 9661920,4560, Fax : 8802-8615583 E-mail : duregstr@bangla.net

11-11-2016

Certificate

This Thesis entitled Supporting Women in ITCs: A Step toward Achieving E-Governance in Bangladesh submitted by TasnuvaHabibZisan for the award of the degree of Master of Philosophy of the University of Dhaka is, to the best of my knowledge, her own work. This thesis has not been submitted, in part or full, to this or any other university for any other degree.

I recommended that the revised thesis may be placed before the examiners for evaluation.

Regards

SYEDA LASNA KABIR, PhD
Professor
Department of Public Administration
University of Dhaka, Dhaka
Bangladesh
lasnakabir@du.ac.bd
lasnakabir@gmail.com
Tel: +88 01727706064

Acknowledgement

By the endless grace of Almighty Allah I have been able to accomplish my M. Phil thesis.

I am grateful and indebted to my honorable supervisor, my mentor Professor Dr. SyedaLasnaKabir, Department of Public Administration, University of Dhaka for her scholarly supervision, generous support, constructive criticism and untiring guidance throughout the preparation and completion of this research. I would also like to express my gratitude to my course teachers and all the members of M. Phil committee.

My mother Mrs. Tambia- Tun- Nessa through her immense encouragement nurtured and motivated me for my research. I would like to thank my aunts Mrs. TahsinaNaznin and Mrs. TanjiaParveen for their huge support in collection of data in rural areas, without which I would not be able to fulfill my research.

Lastly and greatly I would like to thank my husband Muhammad Saiful Islam who stood rock solid beside me and supported me to prepare and complete my research. I also thank him for assisting me in drafting, composing, formatting and reviewing the thesis.

TasnuvaHabibZisan

Abstract

E- Governance is a strategic issue that includes reshaping public administration process of a country mostly at policy making level to make the governance more transparent, accountable to people, efficient and service- oriented. Like other developing countries, Bangladesh is also stepping ahead to achieve E-Governance through usage of Information and communication technologies (ICTs). This study will try to identify the potentialities of women's participation in ICTs for achieving E-Governance in Bangladesh. It also looks at the real scenario of women involvement in ICTs both at urban and rural areas of Bangladesh. Besides these, this study will try to address major problems of supporting women's access to ICT and provide a set of specific recommendations.

In Bangladesh, it is very important to facilitate access to ICT because it is one of the major concerns of E- Governance. Government initiatives for making ICT facilities available at grass root levels and vast campaigning for learning usage of ICT, recruitment of women in ICT related jobs and arranging trainings may increase women involvement in ICTs which is obviously a step toward achieving E- Governance. In this study, supporting women in ICT refers to encouraging women for proper usage of information and Communication technology and to provide guideline for availing these privileges.

The study is being arranged with some chapters like Introduction, rationale for the study, research objectives, research questions, research hypothesis, theoretical and conceptual framework, analysis of research findings, recommendation and conclusion.

Content

Certificate from supervisor	I
Acknowledgement	II
Abstract	III
Table of Contents	Page Number
<hr/>	
Chapter One: Introduction	
1.1 Introduction	1
1.2 Statement of the Problem	3
1.3 Significance of the study	5
1.4 Research Objectives	7
1.5 Research Questions	7
1.6 Research Hypothesis	7
1.7 Scope of the research	7
1.8 Methodology of the study	8
1.9 Description of research area	10
1.10 Limitations of the study	11
1.11 Chapter outline	12
 Chapter Two: Research Methodology	
2.1 Introduction	13
2.2 Research Methodology	13
2.3 Literature review	17
2.4 Theoretical and Conceptual framework	26
2.4.1 Theoretical framework	27

2.4.2 Conceptualizing the study	29
2.5 Variable specification	32
2.6 Operationalization of variables	33

Chapter Three: Level of access of women to ICT

3.1 Introduction	38
3.2 ICT in Bangladesh	38
3.2.1 ICT usage by women	39
3.2.2 Gender based digital divide	39
3.3 E-governance initiatives in Bangladesh	42
3.3.1. ICT policy initiatives by Government	43
3.3.2. Initiatives for supporting women	44
3.4 Gender constraints in access to ICT	45
3.4.1. Challenges to address the constraints	47

Chapter Four: Research Findings

4.1 Introduction	48
4.2 Supporting women in ICTs	49
4.2.1 ICT Policy	51
4.2.2 Socio-economic and cultural factors	53
4.2.3 Digital literacy	56
4.2.4 Availability of ICT tools	58
4.2.5 Formal education	60
4.2.6 ICT entrepreneurship	62
4.2.7 Digital security	65

4.3 Access to ICT in urban and rural areas	67
4.3.1 Transforming gender role	71
4.3.2 Empowerment	73
4.3.3 Involvement with organization	75
4.3.4 Skill of information and communication	77
4.3.5 Involvement in ICTs	78
4.3.6 Digital divide	80
4.3.7 Constraints of access to ICT	81
4.4 E-governance achievement	84
Chapter Five: Analysis of findings	
5.1 Introduction	88
5.2 Access to ICT by women in urban and rural areas	88
5.2.1 Causes of less access to ICT	88
5.3 Suggestion to improve access	90
5.4 Discussions on findings	91
Chapter Six: Test of Hypothesis and concluding remarks	
6.1 Introduction	94
6.2 Test of research hypothesis based on findings	94
6.3 Suggestions	98
6.4 Conclusion	100
Bibliography	101
Appendix	107

List of tables, figures and maps

List of tables:

Table 1.1: Measurement indicators	10
Table 2.1: Number of people in study areas	14
Table 2.2: Description of study areas	16
Table 2.3: Concepts of several theories relating women and access to ICT	27
Table 3.1: Gender based digital gap	40
Table 4.1: Respondents for the study	49
Table 4.2.: Respondents in three different areas	52
Table 4.3: Statistical value for aware of policy initiatives	54
Table 4.4: Relation with access to ICT and social factors of respondents	55
Table 4.5: Statistical value for socio-economic and cultural factors	56
Table 4.6: Level of digital literacy	58
Table 4.7: Statistical value for digital literacy and access to ICT	59
Table 4.8: Availability of ICT tools	60
Table 4.9: Statistical value for availability of ICT tools	61
Table 4.10: Relation with formal education and access to ICT	63
Table 4.11: Statistical value of education	64
Table 4.12: Women entrepreneurs related to ICTs	64
Table 4.13: Statistical value of entrepreneurship	66
Table 4.14: Relation with digital security and access to ICT	67
Table 4.15: Statistical value for digital security	68
Table 4.16: Overall access to ICT by women	70

Table 4.17: Statistical value for respondents	71
Table 4.18: Gender role in urban and rural areas	72
Table 4.19: Statistical value	73
Table 4.20: Empowerment and women's access to ICT	74
Table 4.21: Statistical value	75
Table 4.22: Involvement with organization	76
Table 4.23: Statistical value	76
Table 4.24: Skills of information and communication	77
Table 4.25: Statistical value	78
Table 4.26: Involvement in ICT related job	79
Table 4.27: Statistical value	80
Table 4.28: Digital Divide	81
Table 4.29: Statistical value	82
Table 4.30: Gender constraints	83
Table 4.31: Statistical value	84
Table 4.32: E-governance achievement	85
Table 4.33: Statistical value	86
Table 6.1: Summary of relevant findings against research hypothesis	94
List of figures (Pie-charts and shapes):	
Figure 1.1: Sources of data	9
Figure 2.1: Percentage of female in three specific areas	15
Figure 2.2: Impact of ICT usage on e-governance	30
Figure 2.3: Conceptualizing the study	31

Figure 4.1: Response about access to ICT and existing policy	51
Figure 4.2: Socio-economic and cultural factors	54
Figure 4.3: Digital Literacy	57
Figure 4.4: Highest usage of ICT tools at urban and rural areas	67
Figure 5.1: Reasons of low access to ICT	89
Figure 5.2: Protocol of the identification of information indicators for Bangladeshi women	91
Figure 6.2: Conceptual framework	97
List of Boxes:	
Box 4.1: Case study about women entrepreneurs	65
Box 4.2: Usage of mobile in regular livelihood	70
Box 4.3: Gender role influenced by access to ICT	73
Box 4.4: Contribution of ICT equipped women	87
Box 5.1: Perception of women about ICTs	90
Box 5.2: Family support to women's access to ICT	91
List of Maps:	
Map 1.1: Map of Manda, Dhaka	113
Map 1.2: Map of Kashipur, Barisal	114
Map 1.3: Map of Kishoregonj	115

List of Acronyms

BBS	Bangladesh Bureau of Statistics
DTS	Data Transformation Service
GATE	General Architecture for Text Engineering
HR	Human Resource
ICT	Information and communication technology
ITES	Information Technology Enabled service
ITU	International Telecommunication Union
NGO	Non-Government organization
SIDA	Swedish International Development Agency
SWOT	Strength, Weakness, Opportunity and Threat
UN	United Nations
UNDP	United Nations development program
USAID	United State Agency for International Development

Chapter One: Introduction

1.1. Introduction

The recently emerged concept of E- Governance is now one of the basic trends of modern world. Like other countries, Bangladesh is also gradually stepping toward achieving E- Governance through increasing usage of ICTs. E-Governance means the application of information and communication technology (ICT) for delivering government services, exchange of information communication transactions, integration of various stand-alone systems and services between government-to-customer (G2C), government-to-business (G2B), government-to-government (G2G) as well as back office processes and interactions within the entire government framework (Taifur, 2006 and Valentina, 2004).

In recent years, Information and Communication Technologies (ICTs) have become a potent factor behind development. E-Governance leads to the transformation from a resource based to a knowledge-based economy which demands technological advancement. In Bangladesh, to promote E- Governance, Government has taken several initiatives. Development of Information and Communication Technologies (ICTs) is one the initiatives. Information and Communication technologies (ICTs) refers to the application of modern computing technology to process information, in particular, the use of electronic and computer software to convert, store, protect, process, transmit, and retrieve information from anywhere at any time (<http://searchcio.techtarget.com/definition/ICT-information-and-communications-technology-or-technologies> accessed on 30.10.2016).

ICT is one step toward true E-governance and supporting women in this process is another step to go ahead. The introduction of Information and Communication Technologies (ICTs) into the

daily lives and activities in Bangladesh represents an unprecedented opportunity to improve the lives of people, especially women.

In the present research the level of supporting women in accessing to ICT is the core concern. In this context, support means creating scopes for access and ensuring proper usage of ICT by women at all levels of society. Access to and use of ICT is often linked to social and economic development. These changes can have an overall positive impact on women's work, livelihoods and opportunities. Such as, Low income women have successfully used ICTs for their own interests by forming peer networks through employment interest groups such as the Self-Employed Women Association (SEWA) in India, the umbrella of micro-credit activities like the Grameen Village Phone Program in Bangladesh (USAID, 2005).

To identify the relationship between usage of ICT by women and impact of different infrastructure in both urban and rural areas of Bangladesh, three different areas (South Manda, Dhaka, Barisal Sadar, Barisal and Char Sholakia, Kishoregonj) have been taken as study areas. In urban areas, women are more aware and have more availability of technological resources. So it is a matter of concentration that if these facilities accelerates participation and access to ICT or not. On the other hand, in rural areas like Kishoregonj still technological resources are limited. In this context, comparative analysis will provide representative data regarding access to ICT and impact on E- governance.

Bangladesh has a population of about 168.95 million (<http://www.bbs.gov.bd> accessed on 30.03.2016). Whereas, Male and female ratio is 100.3:100 (<http://www.thedailystar.net/news-detail> accessed on 30.03.16). From above context it is seen that, Bangladesh is a populated country and development of human resources is the way to achieve true E-governance. ICT is

one of the tools for development of this resource. Women represent around fifty percent of this resource. So the overall development depends upon advancement of women.

1.2. Statement of the problem

“There is a technological divide—great gaps in infrastructure. A lot of web-based information is simply not relevant to the real needs of people. And nearly 70 per cent of the world’s websites are in English, at times crowding out local voices and views. There is a gender divide, with women and girls enjoying less access to information technology than men and boys”.

Source: United Nations Secretary-General, Kofi Annan

Statement to the World Summit on the Information Society, Geneva (Retrieved from

<http://www.un.org/womenwatch/daw/public/w2000-09.05-ict-e.pdf> accessed on 30.10.2016)

The term ICT has been used to encompass technological innovation and junction in information and communication leading to the development of social interaction, economic and business practices, political engagement, education, health, leisure and entertainment, etc. Moreover, there has been a growing understanding that these technologies can be powerful instruments for advancing economic and social development through the creation of new types of economic activity, employment opportunities, improvements in health-care delivery and other services, and the enhancement of networking, participation and advocacy within society (UN, September 2005). This study shows that due to women’s less access to ICT and some barriers, impact of using ICT is not visible. That’s why supporting women in ICT and empowerment are needed.

In recent years, usage of technological tools has been encouraged vastly but in developing countries like Bangladesh, it is yet to develop. ICT have the potentiality to improve interaction between Governments and citizens, as well as in fostering transparency and accountability in

governance. However, new technologies have a vast potentiality for empowerment which needs to be fully explored.

Generally rural people in Bangladesh have limited access to resources and public spheres due to their socio –economic situation. Moreover, rural women suffer from severe discrimination, partly due to lack of access to information.

Despite some progresses still the percentage of women having access to ICT is not satisfactory. Compared to men in Bangladesh, women have less access to ICT tools. The following figure shows the gap of using internet between men and women.

Percentage of individuals using the Internet, by gender, latest year available, 2012-2015

Economy name	Latest year	Gender	
		Male	Female
Armenia	2014	56.6	53.0
Austria	2015	88.2	79.7
Bahrain	2015	94.6	98.2
Bangladesh	2013	8.2	5.1
Belgium	2015	85.8	84.3
Bolivia	2014	37.1	32.2
Brazil	2014	55.0	54.2

Source: <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx> accessed on 30.10.16

This research has tried to explore the barriers of women’s access to ICT and the impact of using ICT in Bangladesh. The factors behind less access of women to ICT such as education, technological resources, awareness, working environment, Government initiatives and policies etc has been analyzed in this study. Despite Government initiatives, Patterns of gender segregation are being reproduced in the information economy where men hold the majority of high-skilled, high value-added jobs, whereas women are concentrated in the low skilled, lower value-added jobs (USAID, 2005).

A study found that, contrary to notions about skill development and flexible career advancement, women’s work is often de-skilled and devalued. To address some of these constraints and to

support women in ICTs, this research looks at Bangladeshi women in the knowledge economy, identifies points of intervention in a variety of sectors, and provides a set of specific recommendations for consideration (USAID, 2005).

There are some factors which act as barriers in access to and usage of ICT. Main barriers are lack of technological knowledge and policy. To promote women's full participation and involvement with ICTs, national and sectoral policies need to support women's contribution to economic growth. ICTs can complement and enhance productive activities and livelihood strategies, but depending on where women are employed, they are not always exposed to their benefits (USAID, 2005). In a sentence, this research has focused on the constraints for women, potentiality of supporting women and exploring this support as a step toward true E-governance.

1.3. Significance of the study

Although Bangladesh has challenges when it comes to enabling women's access to ICTs, ICTs can become a part of the solution in addressing the disadvantages that many women face.-

USAID, 2005

Despite several challenges and constraints women are more involved in ICTs. It is necessary to study how this progress can be continued and proper usage of technology may be ensured. Without participation of both men and women, achieving good governance of a country is quite impossible. According to the definition of governance it is- undertaking of activities, management of resources, organization of men and women by groups of people, communities, local government bodies, business organizations and the branches of the state (legislature, judiciary and government) through social, political, administrative and economic agreements that meet the daily needs of people and ensure sustainable development (Hye, 2000). For ensuring

sustainable governance and specifically E- governance in Bangladesh it is necessary to support women in ICT.

When given the tools and support of ICTs, women develop new domestic and export businesses, start new associations to represent their interests, and use e-governance to communicate more effectively and efficiently with their local government officials. Technology can help people lift themselves out of poverty (UNDP, 2001).

Women in Bangladesh face enormous challenges on a regular basis, and many of the gender-specific challenges women face affect their ability to benefit from ICTs. So emphasis on the level of access to ICT is must to gain the satisfactory level of participation of all including male and female equally in society. Women are not only half of the total population; they are also development partners of a country. So, access to ICT enhances the contribution of women in the development.

A few studies have been found on women empowerment and ICT, Supporting gender and ICTs, Higher education of women but there is no specific research on access of women to ICT and the impact on their work and livelihood was found. So this research is necessary to explore the real scenario of access to ICTs. As a student of Public Administration, I have chosen this research topic because in present socio- economic situation of Bangladesh, most women work in various fields. They are involved in providing service for nation. Through this study their increased knowledge of ICT and proper usage may develop their efficiency and capability. So, it is important to conduct such kind of research to identify the constraints for access to communication technology and impacts of utilizing ICT. This study will present some barriers of usage of ICT those are faced by women in both rural and urban areas of Bangladesh. The barriers

are needed to be addressed in National Education Policy, National Women Policy, and National ICT Policy and in development plans of Bangladesh.

1.4. Research objectives

1. To reveal the gaps of access to ICT by women in Bangladesh.
2. To evaluate the impacts of women's usage of ICT on achieving E- Governance in Bangladesh.
3. To find out if there are constraints of women's access in ICTs.

1.5. Research Questions

1. Is women's access to ICT a factor for stepping toward achieving E-Governance?
2. Have any constraints for women's access to Information and communication technology?

1.6. Research hypothesis

1. The indicators of E-Governance in Bangladesh could be enhanced by supporting women access to ICT.
2. Improvement in technological knowledge and creating awareness will decrease constraints for women's access to ICT in Bangladesh.

1.7. Scope of the research

The study is based on three specific areas of Dhaka, Kishoregonj and Barisal. Manda of Dhaka is a semi-urban area, situated adjacent to the city. Kashipur, Barisal Sadar is an urban area having facilities of urbanization. On the other hand, Joshodol of Kishoregonj is a rural area. As a developing country, Bangladesh has urban, semi-urban and rural areas. Therefore, generalization of the study findings for the whole country may be appropriate and may provide guideline regarding women access to ICT. This study considered three geographic locations mainly for testing hypotheses in different socio-cultural areas. The major area covered by the study is

method for measuring women's access to ICT, influence on development of E- Governance, and barriers women face in different environments. Women's access to ICT will be measured in this study through interviews on usage of different ICT tools. In order to measure the influence on E-Governance, the impact of using ICTs on women's work, livelihood, involvement with profession, awareness building, empowerment, employment, etc will be measured. Moreover, constraints for women's access to ICTs will be measured from working environment, involvement in this sector, availability of technologies etc.

1.8. Methodology of the study

This research will be conducted by using quantitative research methodology. It includes some structured techniques of data collection that allow quantification, hypothesis, measurement and operationalization as well as the use of quantitative method of data analysis including statistics and computers (Sarantakos, 1998).

Selection of study area

Bangladesh has eight geographical divisions at the top of administrative unit and four thousand five hundred and fifty unions at the lowest level of administration (www.bbs.gov.bd).

- Selected areas are at same level of administration- unions.
- The three areas have been selected for exploring the real scenario of both rural and urban areas of Bangladesh.

Selection of respondents

Total number of respondents for this study is 266. From Manda, Dhaka the number of respondents is 50. In Joshodol, Kishoregonj the number of respondents is 50. From Kashipur, Barisal the number of respondents is 100. Another 66 respondents are experts and professionals.

The percentage of general respondents in context of whole population is 1.31% who has been selected for the study.

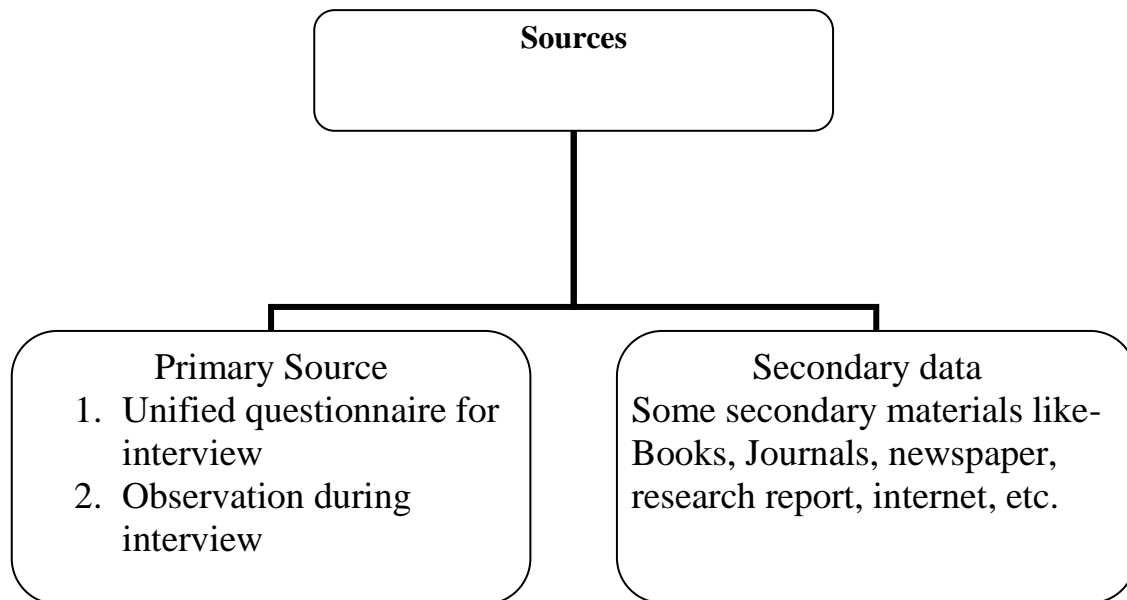
Sampling method

In this study random sampling method has been used to select the respondents. Among the respondents there are both women with no extra privilege or support of ICT and also ICT equipped women. This would provide a comparative scenario of supporting women in ICT.

Sources of data

For conducting this research there are a number of sources of data that helped to fulfill the unified questionnaire has been prepared for this study and through this questionnaire three different areas have been studied. Finally observation is also used for depth investigation of the attitudes of the respondents.

Figure 1.1: Sources of data



Measurement of the study

The following table includes variables of the study and the indicators of measuring those variables have been incorporated:

Table 1.1: Measurement indicators

Dependent variable	Indicators
Level of E-governance	Availability of ICT services
	Involvement in ICTs
Independent variable	Indicators
Supporting women in ICT	Involvement in technological education and access
Access to ICTs by women	Usage of ICTs

Techniques for data analysis

In order to process and analyze the collected data, the following techniques and tools were used-

- To assess the demographic and socio- cultural characteristics of women, rates, average and percentage etc have been used.
- To assess the barriers of women for access to ICT, simple correlation models have been used.
- All the data of this study were processed through Microsoft Word and Excel 2007.

1.9. Description of the research area

For completing this study data will be collected from three specific areas of Bangladesh. Those are Manda, Dhaka, Joshodol, Kishoregonj, and Kashipur, Barisal. These study areas have been chosen because these are located in different geographical places of Bangladesh. Areas are different in socio- cultural aspects and will represent the real scenario in context of Bangladesh.

Some dissimilarity among selected places:

1. Manda, Dhaka is a union and semi- urban area within the capital city, but it is still out of city corporation privileges. Though Manda is an area of capital city, it has cultures of old Dhaka city. Kashipur is a growing urban area, having all the privileges of

urbanization and Joshodol, Kishoregonj is a rural area of Bangladesh. One of the aims of this research is to find out if the scenario differs from rural to urban area.

2. Availability of technological resources, rate of literacy, ICT usage and awareness etc are different in these places.
3. Availability of technological resources, rate of literacy, ICT usage and awareness are different in these places.

1.10. Limitations of the study

This study is based on several primary and secondary data. The researcher has focused on collecting objectives based data for presenting appropriate scenario and to prove the hypothesis of the study. From above context, the limitations faced during the research are mentioned below-

1. As the research has focused deeply on women, it has been difficult to make interview and collect data from women at rural areas.
2. Limited time and area of study.
3. Secondary data may not be approximate.

1.11. Chapterization of the study

The present study consists of seven chapters. The first chapter describes introduction, statement of the problem, significance of the study, research objectives, research questions, Hypothesis, scope of the research, methodology of the study, Unit of analysis, limitations of the study.

Chapter two includes literature review, theoretical and conceptual framework, variable identification and operationalization.

Chapter three describes level of access of women to ICT, History of ICT in Bangladesh, E-Governance initiatives and barriers of involvement in ICTs.

Chapter four includes analysis of research findings, data presentations and chapter five describe analysis of data. Chapter six includes the test of hypothesis. Finally chapter seven present the conclusion of the study.

Chapter Outline:

Chapter 1: Introduction

Chapter 2: Research Methodology

Chapter 3: Level of access of women to ICT

Chapter 4: Research Findings

Chapter 5: Analysis of Data

Chapter 6: Test of Hypothesis and concluding remarks

In this chapter the author has identified the variables, formulated hypothesis and provided an outline of research. In the next chapter the author will discuss about theoretical and conceptual framework of this research.

Chapter Two: Theoretical and Conceptual Framework

2.1 Introduction

In chapter one of this paper, a few research objectives, hypothesis and some questions has been identified. In the current chapter to expand the analysis and to analyze women's access to ICTs and impact on E- Governance as well as constraints for women's access to ICT, some discussions will be added. This chapter presents a brief discussion on research methodology, available literatures related to women's access to ICT, ICT and E-Governance, constraints or barriers for women involvement, gender role and use of technology in context of Bangladesh.

2.2 Research methodology

This research will be conducted by using the following methodology-

- **Rationale for using quantitative approach**

Quantitative method will be applied for the detailed analysis of collected data. For measuring the level of access to Information and communication technology, barriers of using ICTs and impact on E-Governance, quantitative approach will be appropriate.

- **Selection of study area**

The rationales behind selecting these areas are:

- I. Bangladesh has several geographical divisions which have specific differences. Manda, Joshodol and Kashipur are in different geographical locations respectively at capital city, Middle part of country and southern part of Bangladesh. Hence, these will represent the real scenario all over the country.
- II. The study areas represent urban, rural, semi-urban, capital areas of Bangladesh.

- III. Availability of ICTs and other indicators are different in these areas. So it is rational to choose these areas to identify the level of supporting women in ICTs.
- IV. Socio- cultural environment and other living indicators are also different. For this research union Manda, union Kashipur and another union Joshodol have been chosen, so that impact of infrastructural variations can be identified at same level.
- V. The study areas are different on the basis of percentage of female, high educational and awareness problems. As objectives of the study is to find out the ways to encourage women in using ICTs both in rural and urban areas, variations of areas will present area-specific constraints for women's access to ICT.

➤ **Selection of respondents**

The following table presents the number of total population, male and female dweller in within the study areas. Respondents have been selected through snow ball sampling method from the study areas. The statistical data regarding population of three areas are shown separately and specifically in this table.

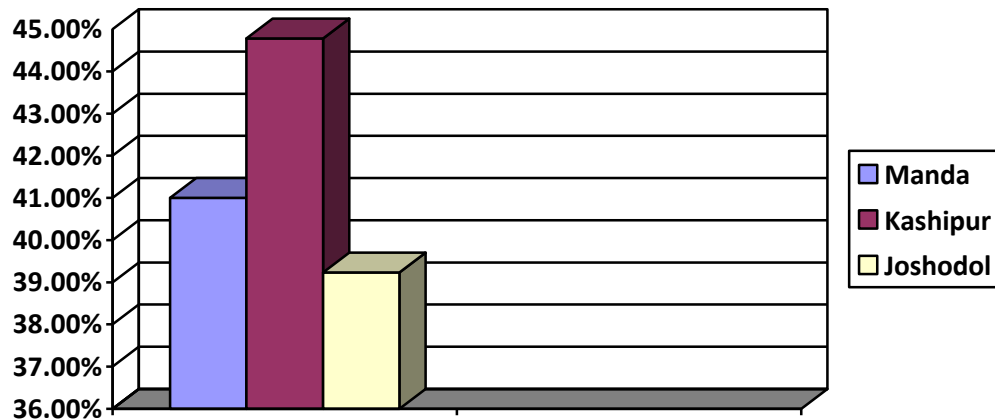
Table 2.1: Number of people in study area

Study area	Male	Female	Number of female (%)	Total population
Manda, Dhaka	6506	4564	41.22	11,070
Joshodol, Kishoregonj	6642	4289	39.23	10,931
Kashipur, Barisal	7996	6482	44.78	14,478

Source: Data collected from www.bbs.gov.bd accessed on 12.06.15

From the above table we can see that, the percentage of female in these areas is on average 41.74% of total population. The percentage of women is almost half of the population.

Figure 2.1: Percentage of female in three specific areas



Source: Data collected from www.bbs.gov.bd accessed on 15.09.2015

In the above figure, description of the sample for this research has been presented in the study. If we calculate the ratio of total population and female, it is 100:41.74 depending upon the study areas.

➤ **Sources of data**

For conducting this research there are a number of sources of data that helped to fulfill the unified questionnaire has been prepared for this study and through this questionnaire three different areas have been studied. Questionnaire has been prepared with some close-ended and open-ended questions. Through the questionnaire, some perceptions of respondents would help to provide policy suggestion.

➤ **Techniques for data analysis**

In order to process and analyze the collected data, the following techniques and tools were used-

- To assess the demographic and socio- cultural characteristics of women, rates, average and percentage have been used.
- To assess the barriers of women for access to ICT, simple correlation, chi square test models have been used.
- All the data of this study were processed through Microsoft Word and Excel 2007.

➤ **Description of the research area**

Basic information about the selected areas is presented below:

Table 2.2: Description of study areas

Type of comparison	Manda	Kashipur	Joshodol
Geographical Location	23° 44' 0'' North, 90° 26' 0'' East	located in between 22°38' and 22°45' north latitudes and in between 90°18' and 90°23' east longitudes	Situated in kishoregonj District, Dhaka division.
Number of total population	11070	14,478	10931
Total area	1236 Acres	24.91 sq km	4536Acres
Level of administrative unit	Local Govt. (Union)	Local Government (Union)	Local Govt. (Union)
Urban facilities	Within the capital city	All Facilities of urban areas	A few facilities
Socio-cultural environment	Mixed socio-cultural	Well culture, high education, and Religious	Indigenous culture

	environment		
Literacy rate	55%	75.3%	65%
ICT services	Union information center	District E-service center and Union information Center	Union information center
Development authority	Union Parishad	Union Parishad	Union Parishad
Number of women	4564	6482	4289
Information centers	01	02	01

Source: compiled from websites and information from city corporation office

2.3 The Literature review

1) Gender equality and empowerment of women through ICT by Department of Economic and Social affairs of United Nations

A study accomplished by Division for the advancement of women, Department of Economic and Social affairs of United Nations was published in September 2005 to promote the goals of Beijing declaration and Platform for action. The study “Gender equality and empowerment of women through ICT” includes discussion on ICT as a tool for development. This report provides a summary of critical gender issues related to ICT and summaries potential opportunities for women’s economic, social and political empowerment. In this report, key strategies to address the gender digital divide in various contexts are presented. Moreover, examples of good practice on gender equality and ICT are elaborated throughout the report. The report focuses on the two-

fold need to address the gender gap and reduce inequalities related to ICT. It also tries to identify ways to use ICT proactively and effectively to promote gender equality and the empowerment of women. It also includes some case studies on usage of ICT tools in Brazil, Senegal, South Asia, Korea, United States, Zimbabwe, Uganda, Kenya, Fiji, Slovakia, etc. The main focus of the report was to uphold the potentialities of ICT for women, specifically, rural women and indigenous community. The report says that “Governments must be committed to adopting specific legislative, regulatory and administrative measures to promote gender equality in the ICT sector, and for developing capacity and creating monitoring frameworks to ensure implementation of Beijing declaration”.

2) Supporting Gender and ICTs: Opportunities for women in Bangladesh by USAID

It is a report which was prepared for USAID/Bangladesh by the GATE Project, Development & Training Services, Inc. (DTS), an initiative of the USAID Office of Women in development. Melinda Packman edited and completed the final document for presentation to USAID, based on a study conducted by Nidhi Tandon, a consultant to DTS. In this report a brief discussion is found on gender constraints in Bangladesh, ICT policies and their implications for women, telecommunication infrastructure, ICT education and training initiatives, business trends, impact of ICT in involving women in knowledge economy. Moreover, this report suggested some policy recommendation for reducing gender constraints in Bangladesh. This study says that ICTs have the potential to enable women to become equal stakeholders in the growing knowledge economy.

3) Gender Empowerment through ICTs: Potential and Challenges for Women in the Caribbean by Nancy Muturi

This study found that Information communication technologies (ICTs) have been promoted as a tool for national development and for gender empowerment in many developing countries. In the

Caribbean, governments, non-governmental organizations and various training institutes play a vital role in ensuring access of women to ICTs. Gender empowerment is paralleled to access to information and technology but there are several concerns related to ICT access and their effective use among women that are not yet addressed. This study addresses those issues as well as social, cultural, economic and other factors that challenge women's access and use of communication technology. The study recommends further research in policy development to focus on gender constraints and strategies that will ensure women's participation in their own empowerment through ICTs.

4) Economic empowerment of women through information technology: A Case Study from an Indian State by Dr. P.N. Prasad and Dr. V Sreedevi

It is widely accepted that Information Communication Technologies (ICT) offer enormous opportunities for the comprehensive social and economic development of the people all over the world. The article identifies that without its adoption, there is a little chance for countries or regions to develop. This study tries to focus on the potential of ICT as a technology for promoting micro-enterprises by poor women which is still unused in many countries. This article discusses the success story of a government project for poverty eradication using ICT in India. The case study on ICT micro-enterprises by self-help group of poor women explores the story of a self-help group, which uses privileges of ICT for poverty eradication through economic empowerment of poor women. It discusses how ICT can effectively be utilized as a tool for micro-enterprises, which are promoted by poor women under self-employment scheme. The article also deals with SWOT analysis that identifies the strengths, weaknesses, opportunities and threats for ICT based micro-enterprises. The article proves that if a country has the necessary

enabling environment permitting the establishment of ICT micro-enterprises, poor women can promote such business for their economic development.

5) ICT impact on socio-economic conditions of rural Bangladesh by Atiqur Rahman et.al.

It is a study, published in Journal of World Economic Research, in 2013. It gives a scenario of using ICT by rural people in Bangladesh. In the study, four different villages (520 respondents) from four districts of Bangladesh have been selected to find out how ICTs played a catalytic role in spreading of information, knowledge transfer, healthcare facilities, capacity building and governance and the data were collected during December 2011 to February 2012. The study revealed that factors like social security, rural economy, health care facilities, women empowerment, disaster and emergency response etc. are very much reshaped and influenced by ICTs in Bangladesh.

6) Gender Evaluation Methodology for Internet and ICTs by Chat Garcia Ramilo and Cheekay Cinco

The authors discussed about gender issues, impact of ICTs on gender equity and equality, empowerment and ICT indicators etc. According to the essay, ICTs must be made available to all at an affordable cost while the development of infrastructure must ensure that marginalized groups, sectors, and peoples are not further disadvantaged. The internet and ICTs can be used to uphold diversity and provide a platform where pluralism of ideas and opinions are guaranteed, and cross cultural exchanges are encouraged. According to authors, “this can only be true if developments are driven by a desire to preserve and enhance local, national and regional cultural and linguistic diversities”.

7) E-governance horizon scan report: an assessment study of e-governance in Bangladesh by a2i, PMO, Bangladesh

The report was published in 2007, which identified that, the journey for establishing e-governance system in Bangladesh faces challenges that can be summarized by three A's: Access, Awareness and Applications. If access is not ensured, the remaining constraints may not be reduced. As a developing country, it is a challenge for the government to finance capital intensive endeavors like access backbones and communication infrastructure, while new ICT tools remain beyond the purchasing power of most Bangladeshis. The report focused on ICT profile of Bangladesh, citizen's expectations, infrastructure and service sector and adaption of ICTs, etc.

8) E- Government in Bangladesh: prospects and challenges by Noore Alam Siddiquee and Md. Gofran Faroqi

This book focused on the overall policy and institutional framework of e-government from the perspective of Bangladesh. Recognizing the current government's attempt at branding the country as "Digital Bangladesh," the authors tried to explore major e-government programs and initiatives in operation. Most importantly, they elaborated the constraints and challenges facing in Bangladesh to acquire electronic governance and also shed light on the way forward. The book consists three sections. The first section outlines the policy issues and institutional framework for e-government in Bangladesh. Section two focuses on the current status of e-government in Bangladesh emphasizing on some of the major programs and initiatives. The final section analyses some of the key challenges confronted by Bangladesh in terms of e-initiatives and online service delivery.

9) E- Governance-- The new age governance by Pankaj Sharma

It is a book consisting concepts of Governance, E-Governance and role of ICT in E-Governance with some case studies. In this book authors developed a model of E-government services. According to the authors, E- governance is a part of good governance where the emergence of new information and communication technology can encourage participation of citizen, transparency, accountability to the people, and voice of the vulnerable is heard regarding decision making, etc. This book also includes some related concepts like- E- Business, E-Democracy, E- Republic, stake holders of E-governance, etc.

10) Gender responsive E- governance: Exploring the transformative potential by Nadia Hijab and Raúl Zambrano

It is a report prepared to fulfill the mandates of UNDP for gender equality and women's empowerment through E- governance programming. This report addresses some gender related issues and some case studies. It also identifies that there is a gender gap in context of E-Governance. It focused on access of both men and women to ICTs. To enlarge UNDP's contribution to e- governance programs, an extensive mapping was completed at the end of 2005 of all related programs supported by the organization and its partners. The exercise revealed 195 ongoing projects in 100 countries and explored that the demand for support covers five key areas of UNDP's e-governance programs- "(1) access to ICTs; (2) e-administration; (3) e-service delivery; (4) access to information via ICTs; and (5) e-participation via ICT networks and networking".

11) Women, Gender and Development contemporary issues: Nazmunness Mahtab

This book has been incorporated with the several dimensions of gender issues in the world as well as Bangladesh. Professor Mahtab has accumulated several theories regarding gender and development issues. She has incorporated the governance issue from the gender perspective. In

the book the author developed a diagram showing the relationship between gender role and good governance.

Author suggested that without participation of women governance will be poor. Usage of ICT may be one of the ways to participate in this process.

12) The elusive agenda : Mainstreaming women in development by Rounaq Jahan

The author has incorporated her thinking regarding the importance of the inclusion of women in development of Bangladesh. She has added several developments regarding the women participation in the development sector. She has also presented the women's agenda including their rights in eight sectors those provided below:

- a. Rights to legal equality, enforcement, enforcement, awareness- raising
- b. Entitlement means access to and control over productive resources and services
- c. Investment including elimination of the gender gap in human development and support for gender needs.
- d. Poverty
- e. Security
- f. Empowerment

According to her opinion women can be empowered through a break out of gender subordination.

2.3.1 Access to ICT:

Innovative use of ICTs can facilitate governance with more accountability, transparency, efficiency and greater citizen's participation. Availability, accessibility, connectivity, and affordability are the prime drivers of e-governance. Any lack of these drivers may cause users' reluctance as to acceptance and adoption of e-governance initiatives or users may limit their usage of e-governance activities. Accessibility refers to usage of e-governance. Inadequate

permission, interconnectivity, interoperability, and inappropriate user facilities can limit accessibility (www.electronicgov.net accessed on 29.07.2016). Appropriate user facilities for access become an issue when language or disability creates a barrier. Usability is defined as the ease with which users are able to use an electronic service that is provided with adequate functionalities (www.pacis2014.org accessed on 29.07.2016).

2.3.2 Constraints of women's access to ICT:

According to several studies there are some major interrelated and interacted factors that hold back women's participation and access to ICT. These are:

- a. Illiteracy
- b. Socio-cultural constraints
- c. Infra-structural limitation

SIDA conducted a study on Gender specific ICT issues in development and identified the following constraints affecting women in ICTs-

1. **Poverty has a multi-dimensional impact on women:** Women globally access to financial assets such as land, or to credit. This limits their possibility to use all forms of technology, including ICT.
2. **Women and girls make up nearly 2/3's of the world illiterates:** This limits their use of ICT. It puts the obligation on users of ICT for development approaches to include information and training suitable for those with low literacy rates.
3. **Language is a barrier to internet and mobile use:** In rural areas and among ethnic minorities, where women and girls often have lower education and less exposure to the surrounding society and international arena, they may only speak a local language or dialect. Thus they face hindrances when accessing the Internet and using mobiles,

as the predominant language is English or the national language, and the Roman alphabet.

4. **Science and technology are viewed as more suitable for boys and men:** This may lead girls to shy away from studying computer science or adopting new technology. However this is not clear cut: in some countries of South and West Asia computer science is viewed as a women's field.
5. **Cyber laws are often gender blind:** In many countries, legal regulations also serve to censor the internet broadly, which also affects women. Social media platforms are often reluctant to deal with misogynist expressions, and government as well as the private sector has been slow or hesitant in responding to online violence.
6. **Women's rights defenders face gender specific risks:** Misogynist hate speech, online harassment and threats are increasingly affecting individual and groups of women who use internet for political participation, freedom of speech and for access to information. Online vulnerability often leads to threats, harassments and violence offline.
7. **Women and women's activists need digital safety:** ICT are on one hand new arenas on which women experience violence, and on the other it may also change the ways in which women respond to violence. Online gender-based violence must be tackled and women need access to tools for digital security to protect them.

2.3.3 Impact of supporting women in achieving E-governance:

Several theories identify specific influence of gender role, women's perception about ICT, acceptance of technology and usage of ICT on e-governance. The above discussion shows that supporting women is an influential factor behind achieving E-Governance. According to a study-

Gender and ICT which was published in 2015 by SIDA, ICT can be a powerful factor for political and social empowerment of women, and a tool to promote E- Governance. Strategies to counter gender inequality may include:

- a. Supporting networks of women's rights, including online rights, advocates in order to enable them to address gender and ICT policy at national, regional and global level.
- b. Build awareness among users about the impact of online behavior on gender-based violence.
- c. Support freedom of expression advocates to build awareness of online violence as an inhibitor of women's free speech.
- d. Consider implications of particular conditions and patterns of access and use, differences on account of demographics, age, level of education, etc.

If women are given such support and appropriate access to ICT, E- governance may truly be achieved.

2.4 . Theoretical and Conceptual framework

Gender and communication technology is an area that has attracted interest from various disciplines with increased interest among researchers, from scholars, practitioners and policymakers (Robins, 2002). Research in this field has ranged from exploring the impact and effectiveness in the new technologies in political, social and economic development and restructuring (Shade, 2002). Some of the earlier researchers in the field of gender and communication technologies included the work of Lana Rakow (1986) whose focus was on women and the use of the telephone, she summarized in her study that the telephone assumes an important function in women's lives – a way of maintaining long-distance communications with family and friends, and a way of easing domestic isolation (Rakow, 1986).

Traditional communication theories that explain the access and use of new communication technologies include the diffusion of innovations theory (Rogers, 1995) and Uses and gratifications theory (Blumler and Katz, 1974).

Viswanath Venkatesh introduced the theory of acceptance and use of technology which is related to usage of ICT and access to technology. The unified theory of acceptance and use of technology (UTAUT) has tried to study acceptance and use of technology in a consumer context. The theory incorporates three constructs into UTAUT: hedonic motivation, price value, and habit. According to the theory, individual differences—namely, age, gender, and experience—are hypothesized to moderate the effects of these constructs on behavioral intention and technology use (Benbasat and Barki 2007; Venkatesh et al. 2007). He identified that gender is a factor influencing usage of ICT tools.

2.4.1 Theoretical framework :

Table 2.3: Concepts of several theories relating women and access to ICT

Theorists	Concepts
Shade	He has focused on exploring the impacts and effectiveness of new technologies in political and socio-economic development and reengineering the roles of individuals.
Thussu	The author focused on inequalities of access to various newer technologies, which have been an ongoing and universal issue since the 1970s.
Rakow	His focus was on women and the use of telephone. She summarized in her study that the telephone is an important function in women’s lives – a way of maintaining communications. She also identified that

	ICT tools ease the role of women.
Viswanath Venkatesh	He introduced the theory of acceptance and use of technology which is related to usage of ICT and access to technology. The unified theory of acceptance and use of technology (UTAUT) has tried to find out acceptance and use of technology in a consumer context.
Susan B. Shimanoff	The theory is grounded in the supposition that individuals socially identified as males and females tend to occupy different ascribed roles depending upon access to technology.
Weiss and Hartle	Performance of individual depends on a process of understanding what is to be achieved, and how it is to be achieved, and an approach that increases the probability of achieving success.

Source: Compiled from www.vvenkatesh.com, a student paper submitted to university

Teknologi Mara, www.krex.k-state.edu, and www.knowledge.sagepub.com accessed on 29.07.2016

From above discussion the author identified gender role theory to form conceptual framework and analyze the data.

➤ **Gender Role theory**

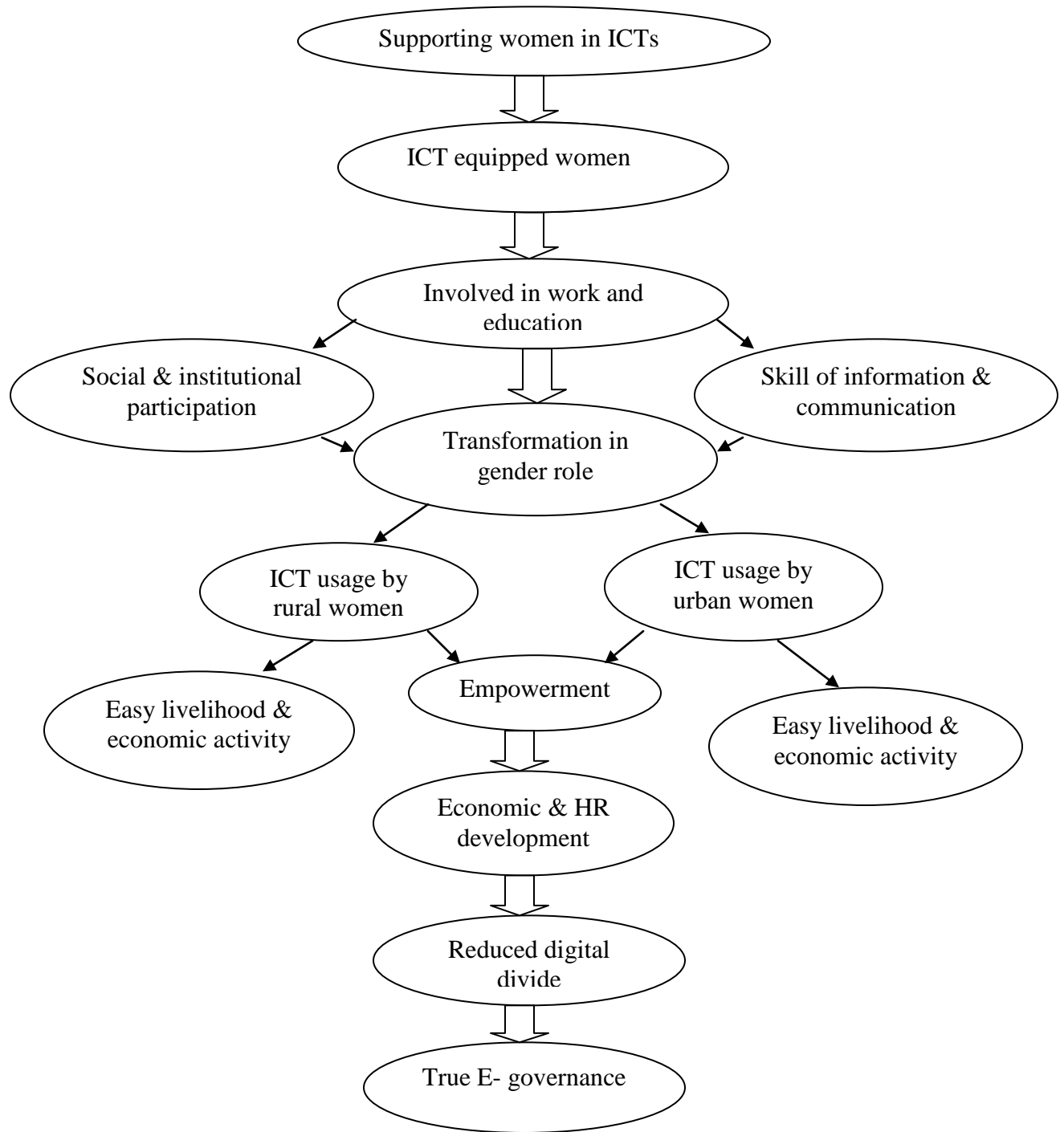
Susan B. Shimanoff introduced Gender role theory. Gender role theory is grounded in the hypothesis that individuals socially identified as males or females tend to occupy different ascribed roles within social structures and tend to be judged against different expectations for how they ought to behave. The theory predicts that males and females will develop different skills and attitudes and behave differently. Communication researchers have used gender role

theory to explain and predict (a) the communication behaviors of females and males and (b) the evaluation of the same communication behavior, when males and females perform it (Hardy, 1995). Drawing upon Gender Role Theory, Women needs different support system than men and will perform efficiently.

2.4. Conceptualizing the study

In the earlier theoretical discussions a number of theories related to women and ICT have been identified. For this research, gender role theory of Susan B. Shimanoff and performance management theory have been involved by the author.

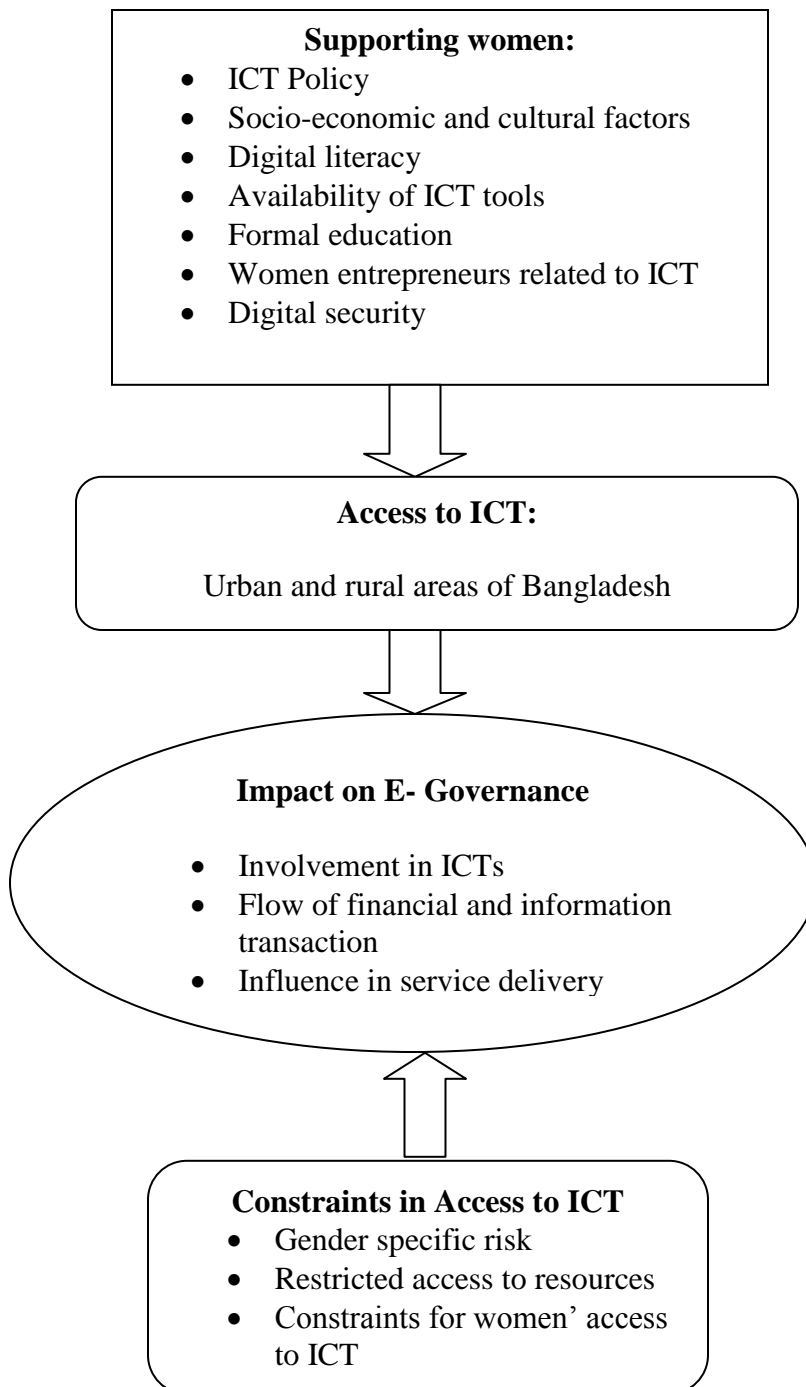
Figure 2.2: Impact of ICT usage on e-governance



Source: Prepared by the author in light of gender role and performance management theory

A conceptual framework has been developed to analyze the variables on the basis of the theories-

Figure 2.3: The conceptual framework of this research



(Source: Author)

In the figure, the author has conceptualized the main concept of the research that supporting women influence the access of women to ICT and supporting influences women involvement in achieving E- Governance in Bangladesh. Access to ICT is shown in three contexts- Urban, Semi-urban and rural areas of Bangladesh.

In this study I have conceptualized that there are some barriers or constraints against women’s access to ICT including gender discrimination, availability of ICT tools, psychological pre-conceptions etc.

2.5. Variable specification

There are two types of variables in this study which are- Independent variable and dependent variable. The following figure shows these two types of variables-

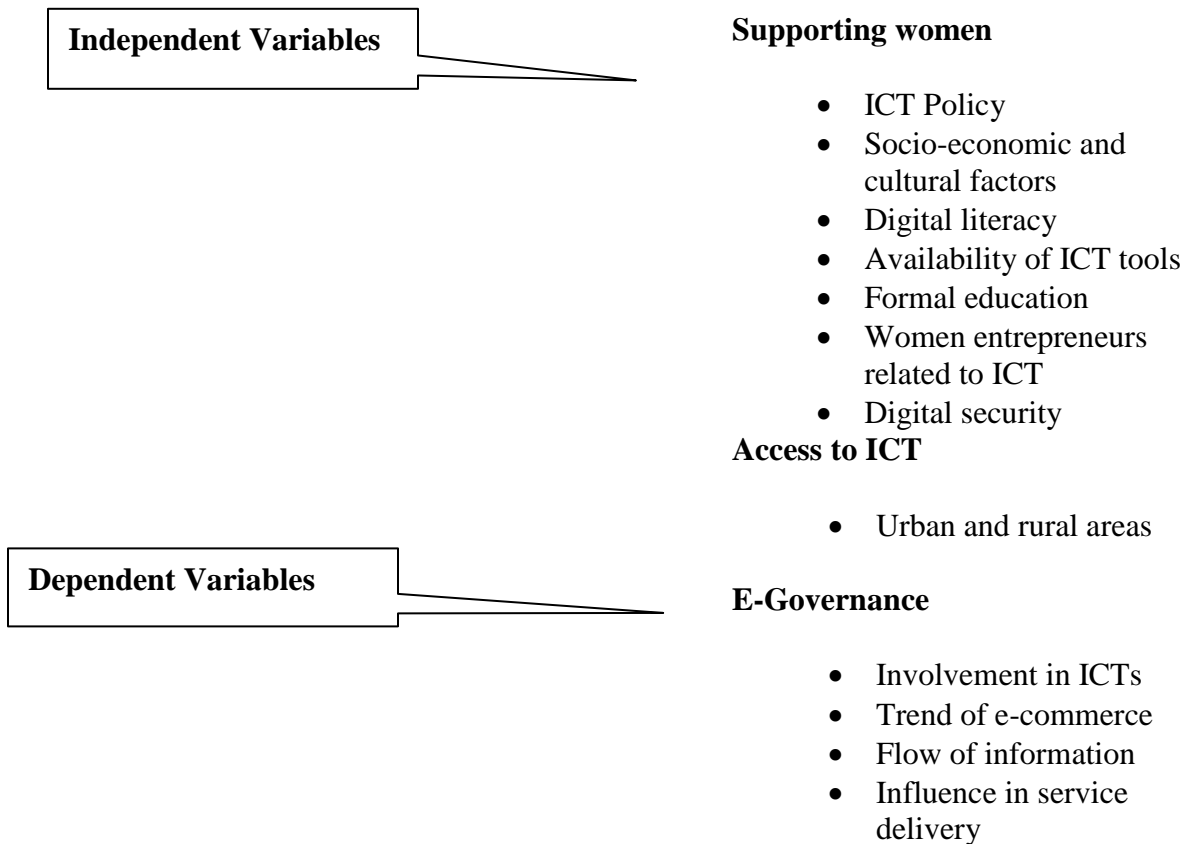


Figure 2.4: Variables of the study

Source: Author

2.6. Operationalization of the variables

To present the research findings and analysis more clear and specific, some indicators have been defined below-

➤ **Supporting women:**

Supporting means creating scopes and encouraging involvement of women which is the main concern of this research (Compiled from Wikipedia). In this study the information about women friendly initiatives by government, socio-economic and cultural factors, digital literacy, availability of ICT tools, formal education, and woman entrepreneurs related to ICT and digital security, etc are considered as supporting factors. Support efforts includes creating content that reflects women's needs and voices through safe and secure online spaces for women and girls(www.fraw.org.uk accessed on 12.07.2016).

➤ **Digital literacy**

Digital literacy means basic learning and communication skills needed for electronic tasks (https://en.wikipedia.org/wiki/Digital_literacy accessed on 29.07.2016). These skills include familiarity with basic computer use and word processing, such as the ability of the user to establish an email account, communicate via email, navigate and understand the basic etiquette of using the Internet, download information, use CDROMs and other interactive materials, and the ability to use electronic forms of communication for distance education, etc. (DTS, 2005).

(<http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan038249.pdf>

accessed on 12.07.2016).

➤ **ICT policy**

A policy is a deliberate system of principles to guide decisions and achieve rational outcomes. A policy is a statement of intent, and is implemented as a procedure or protocol (Compiled from Wikipedia). In the present study, ICT related policies have been analyzed to measure support to women. The 'National Information and Communication Technology (ICT) Policy-2015' has been approved recently by the cabinet aimed at development and promotion of ICT sector to ensure its effective use to achieve nation's development goals (<https://www.usaid.gov/what-we-do/gender-equality-and-womens-empowerment> accessed on 29.07.2016).

➤ **ICT tools**

ICT means information technology (IT) which stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems. The broadness of ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form, e.g. personal computers, television, email, robots, etc.

(https://en.wikipedia.org/wiki/Information_and_communications_technology accessed on 12.07.2016)

➤ **Digital security**

Digital security is the protection of one's digital identity. Digital security includes the tools and actions used to secure ICT user's identity, assets and technology in the online and mobile world (Compiled from Wikipedia).

➤ **ICT based entrepreneurs**

ICT based entrepreneurship refers to entrepreneurial activities is an important benefit of ICT, which has not been realized properly in many developing countries. The areas of ICT entrepreneurship development are: The business Centre, Graphics Centre, Music Studios, the Internet Centre, Computer Training Centre, Computer Technicians, Web design and hosting, Internet employment agency services, Internet advertisements, Internet tourist and travelling agencies, etc. (<http://www.ejbss.com/Data/Sites/1/vol3no6september2014/ejbss/recent.aspx> accessed on 12.07.2016)

➤ **Access to ICT**

Access means physical access to the technology and the ability to utilize it, access also refers to the ability to make use of the information and the resources provided (UN, 2005). In this study, access to ICT has been measured in urban and rural areas.

➤ **Urban area**

An urban area is a location characterized by high human population density and many built environment features in comparison to the areas surrounding it. Urban areas may be cities, towns or conurbations (https://en.wikipedia.org/wiki/Urban_area accessed on 12.07.2016), enjoying the privileges of urbanization.

➤ **Semi- urban area**

The difference between semi-urban areas and rural areas is the development of the geographic area and environment. A semi-urban area is between urban and rural, or partly urban (<https://www.quora.com> accessed on 12.07.2016). In this study, this term has been used to explain the areas which are yet to enjoy all the privileges of urbanization.

➤ **Rural area**

In general, a rural area or countryside is a geographic area that is located outside towns and cities. Typical rural areas have a low population density and small settlements (Compiled from Wikipedia).

➤ **Infrastructure**

Infrastructure refers to the fundamental structures, systems, and facilities serving a country, city, or area, including the services and facilities necessary for its economy to function. It typically characterizes technical structures (Compiled from Wikipedia). ICT infrastructure will influence access to ICT.

➤ **E-governance**

E-Governance means the application of information and communication technology (ICT) for delivering government services, exchange of information communication transactions, integration of various stand-alone systems and services.....Interactions within the entire government framework (Taifur, 2006 and Valentina, 2004).

➤ **E- commerce**

E-commerce means electronic commerce. It refers to selling, buying, or organizational management activities conducted via the Internet (DTS, 2005).

➤ **Flow of information**

Flow of information means transfer of information from original settings to its end users in a given process (Compiled from Wikipedia). In this study, flow of information has been used to measure the level of E-governance.

➤ **Paperless communication**

Paperless communication is a recently discussed issue which means using electronic tools for communication, such as- e-mail communication instead of paper memos/

photocopying notes, in internal and external networking (<https://www.commercial.hsbc.com.hk/1/2/commercial/livingbusiness> accessed on 12.07.2016)

➤ **Involvement in ICTs**

There are several ICT organizations and programs in Bangladesh. Involvement in these organizations creates opportunities for women to contribute in achieving E-governance through economic and social change (Compiled from a student paper submitted to Lincoln University).

➤ **Availability of ICT tools**

Availability means coverage of ICT tools. It can be measured through the rates of technology (generally PC) and connectivity (telephone, Internet) penetration -that looks at what is actually accessible by users (DTS, 2005). In this research, it also seeks to measure what level of coverage exists in urban, semi-urban and rural areas of Bangladesh. Moreover, the online availability of public services is determined by the extent to which it is possible to provide a service through Internet (www.egov.alentejodigital.pt accessed on 29.07.2016).

In the present chapter, concepts regarding women's access to ICT and e-governance have been defined and explained. Literature and theories have been analyzed and a theory has been recognized to verify that women's access influences e-governance. In the next chapter, level of women's access to ICT would be analyzed.

Chapter three: Level of women's access to ICT in Bangladesh

3.1. Introduction:

This chapter will describe about the level of women's access to ICT in Bangladesh and explore the present scenario of women involvement in usage of ICT both in rural and urban areas. Moreover, this study discusses steps taken by Government to enhance involvement and the existing digital gap based upon gender.

3.2. ICT in Bangladesh:

ICT is the spine of any digital initiative. ICT covers a vast area of information, communication and telecommunication technology. ICT development in Bangladesh is entrenched in a vision of Digital Bangladesh. Digital Bangladesh is an idea that includes the IT use for management, administration and governance to ensure transparency, accountability and answerability at all levels of society and state (<http://www.digitalworld.org.bd/digital-bangladesh-and-ict> accessed on 31.08.2016).

Though we have a 50 years history of introducing ICT, the government has recently started the process of developing a national strategy. In 1997 government took initiative to make a national ICT policy. In 2002 Bangladesh identified ICT as a "thrust sector" as it represents potential for quick successes in reforms, job creation, industry growth, improving governance and facilitating inclusion, and it has high spillover effects to other sectors. Today, in Bangladesh, the overall IT sector (excluding telecoms) is small, valued at \$300 million, with IT/ITES claiming 39%(\$117 million) of that value. The overall IT/ITES industry has enjoyed a high growth rate of 40% over the last five years (<http://www.digitalworld.org.bd/digital-bangladesh-and-ict> accessed on 28.06.2016).

3.2.1. ICT usage by women:

Social justice considerations suggest that women should have a “fair share” of the high status, high paid and influential jobs in ICT sector- Ahmed et. al.

A fair share is the issue in this study. Given that ICT sector in Bangladesh is in its infancy, steps should be taken to promote a strategic roll out of ICTs that engages with women and men equally. There are key challenges; that constrain women’s equal access to both the tools and the content of ICTs. One of the most critical challenges is that of the socio-economic status of women and especially poor and rural women in Bangladesh.

According to a study, 40% of girls are under 14 years old at marriage- which is most common in the rural areas. A third of the population is under 15, and 63% are between the ages of 15-64 with women making up the lesser proportion in relation to men in both age groups (compiled from world bank statistics). In this situation, proper usage of ICT depends upon support by the means to using ICTs, for communications and information purposes to access entitlements, credit, employment and sources of income.

But there are distinct differences between men and women in their access to resources, information and support structures. Women usually face higher barriers to the kinds of applied training that can equip them with computer literacy or engagement in ICT related employment than men. Compared to men, women have less time in which to balance out the tension between earning and household and childcare.

3.2.2. Gender based digital divide:

“Visions of a global knowledge- based economy and universal electronic commerce, characterized by the ‘death of distance’ must be tempered by the reality that half the world’s population has never made a telephone call, much less accessed the internet”-OECD(1991)

The above quotation is retrieved from the Economic and Social Impact of Electronic Commerce: Preliminary Findings and Research Agenda of 1991. The scenario represents digital divide. The term” digital divide” refers to the gap between individuals, households, business and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies(ICTs) and to their use of the internet for a wide variety of activities.

In a study it is shown that, the main backward community of our society is women. There is a digital gap caused by- lack of education, economic condition, fear of technology use, lack of English language, family responsibility, social aspect for availing internet facilities from outside, working environment and professional need assessment.

(www.unpan1.un.org/intradoc/groups/public/documents/.../unpan005828 accessed on 01.09.2016)

From table 3.1 we can see some key gender factors in accessing ICTs in Bangladesh.

Table 3.1 gender based digital gap

Gender specific factors	Implication for women
Higher level of illiteracy among women	The literacy rate is about 35% among the rural female population and about 57% among the urban female population. Illiterate women are “information poor”- they need to make informed choices, to be able to unite around their common objectives. Basic literacy is

	<p>integral to future reskilling of women in the ICT labour force, as well as enabling women to push for their legal rights.</p>
<p>Women's relatively lower access to and control over resources</p>	<p>There are distinct differences between men and women in their access to resources, information and support structures. Women usually face higher barriers to the kinds of applied training that can equip them with computer literacy or engagement in ICT- related employment than men. As well, compared to men, women have less time in which to balance between earning and household.</p>
<p>Imbalances in education and training between men and women</p>	<p>This is a significant challenge even under 'normal' circumstances. Bengali women, however, face an even more challenging set of circumstances where both the schooling system and the social structure reinforce each other and work against women's equal access to training- from primary to higher qualifications.</p>
<p>Imbalances in economic independence between men and women</p>	<p>Women are dependent because they do not have their own economic base or security back up. The chief inputs they need to build such a base- skills, credit and land- are largely inaccessible to them. Less access to collateral and subsequently less access to finance and capital means that they are less likely to invest in or to pay for ICT use.</p>

<p>Inequalities in industry, working conditions and remuneration between men and women</p>	<p>As jobs become more technologically advanced and in turn more remunerative, female workers often remain clustered in a low-skilled occupation with lower pay and lower priority for training or skill upgrading.</p>
--	---

Source: <http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan038251.pdf> accessed on 01.09.2016

3.3. E-governance initiatives in Bangladesh:

The slogan of “Digital Bangladesh” with vision 2021 of the Government of Bangladesh has special significance for e-governance for national development. In spite of several blockages and limitations, works are in progress for realization of e-governance in all areas of administration. Many e-government projects have already been completed and a big number of projects are under progress. The nation, with well over 120 million mobile subscribers and 43 million Internet subscribers, enjoys the fruits of e-governance in numerous areas of activities. (<http://www.thedailystar.net/25th-anniversary-special-part-1/e-governance-and-bangladesh-210577> accessed on 29.03.2016). The ultimate objective is to make more and more e-services available to the people with increased digitalization

Recent examples of available e-services are: creating database through national identification card (NID), registration for admission to academic institutions, publication of results of examinations, registration for jobs abroad, registration for pilgrimage, delivery of official forms, online submission of tax returns, online tendering, online banking and many more. SMS services for lodging complaints to police stations, online bill payments for utility services, instant communication with persons working abroad, and e-passports are examples of more e-services.

Telemedicine services, videoconferencing for the treatment of diseases, and video conferencing for administrative activities are special examples of e-services available for rural Bangladesh. Setting up of nearly five thousand Union Information Service Centers is a great boost for e-service delivery, especially for rural areas. Turning eight thousand village post offices and approximately five hundred upazila post offices into e-centres and the introduction of mobile money order and postal cash cards are significant achievements in the recent past. Union Information Centres, District Information Cells, National Information Cell are also revolutionary additions for e-services for the citizens. Deputy Commissioner Offices in districts and UNO offices in upazilas provide a large number of e-services to rural clients (<http://www.thedailystar.net/25th-anniversary-special-part-1/e-governance-and-bangladesh-210577> accessed on 31.08.2016).

3.3.1. ICT policy initiatives by Government:

The cabinet has recently approved the draft of the 'National Information and Communication Technology (ICT) Policy-2015' aimed at development and promotion of ICT sector to ensure its effective use to achieve nation's development goals.

The approval was given in the weekly meeting of the cabinet held at Bangladesh Secretariat with Prime Minister Sheikh Hasina in the chair. Cabinet Secretary M Musharraf Hossain Bhuiyan said the policy is an updated version of the ICT Policy-2009 which has been revised with the opinions of all stakeholders, ministries, experts and professionals (<http://newagebd.net/91579/cabinet-okays-draft-of-ict-policy-2015/> accessed on 01.09.2016).

According to the draft the revised ICT policy is less regulatory but more developmental and promotional aimed to ensure comprehensive and effective use of ICT to materialize the

government's vision to make Bangladesh a middle income country by 2021 and a developed one by 2041.

“The main vision of the policy is to promotion and multipurpose use of ICT to ensure transparency and accountability of the government, human resources development, ensure public services through public and private sector participation and achieve national development goals by 2021 and 2041”- The cabinet secretary. The draft also focuses on supporting women through various outsourcing projects.

The policy has ten special objectives, 56 strategic themes and 306 action programs which will be implemented by different organizations under short, medium and long term time frame by 2016, 2018 and 2021 (<http://newagebd.net/91579/cabinet-okays-draft-of-ict-policy-2015/> accessed on 01.09.2016).

3.3.2. Initiatives for supporting women:

Government of Bangladesh has recently taken some gender specific projects and programs to address the lacking of women in ICT. Some of these projects are accomplished and some are proposed for next fiscal year. The projects are discussed below:

Learning and earning development project- Under this project 20,000 women who have passed SSC/HSC received basic IT/ICT training. This project was aimed at enhancing self-employment and online outsourcing. It is an ongoing project.

One family one woman: Empowering women through ICT- There is proposed project like- 1,00,000 women in 64 districts will be provided with laptop, server and storage facilities so that

they are included in the network and become entrepreneur. This project has been proposed for tk. 561.47 crore but the duration is yet to be decided.

Completed projects-

Basic ICT skill transfer up to Upazila level- This project was initiated in 2011 and continued to 2014. Under this project, students both female and male at upazila level received basic ICT training in schools.

Bari bose borolok project- In this project educated- unemployed women of any age are provided out sourcing training, so that they can earn staying at home. (Information about projects/ programs are compiled from <http://ictd.gov.bd/program/current> accessed on 31.08.2016)

3.4. Gender Constraints in access to ICT:

There have been a number of studies to identify the constraints for women in accessing to ICTs.

In this study, some specific constraints are mentioned-

Illiteracy: The literacy rate in Bangladesh is about 35 percent among the rural female population, and 57 percent among the urban female population. Low levels of literacy are an obstacle to women's participation in the knowledge economy. In addition, women tend to have more fears and pre-conceptions about technology in general compared to men. Basic literacy and overcoming fears are integral to future skilling and re-skilling of women in the ICT labor force.

Restricted access to and control over resources: There are distinct differences between men and women in their access to resources, information and support structures. Women usually face

higher barriers than men in accessing the kinds of applied training or resources that can equip them with digital literacy or applied ICT skills for engagement in ICT-related employment. In addition, compared to men, women have less time to balance out the tension between earning an income and household and childcare activities.

Training and education imbalances: Training and education opportunities are typically held with mixed-sex groups. However, the Bangladesh social system is male-oriented, and Bangladeshi women face even more challenging circumstances where both the school system and social structure reinforce each other and work against women's equal access to training and education, from the primary level to higher education. Without training and education initiatives targeted to women, ICTs cannot function as an equal resource.

Economic imbalances: Women are often dependent on men because they do not have their own economic base. To build such a base, skills, credit, and land are needed and these are largely inaccessible to women. Less access to collateral and subsequently less access to money means they are less likely to invest in or to pay for ICT use, hindering their ability to access public and government information and services.

Inequality in working conditions and remuneration: As jobs become more technologically advanced and, in turn, better remunerated, female workers often remain clustered in low-skilled occupations with lower pay and less likelihood for training or skill upgrading.

(Above information about gender constraints are gathered from <http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan038249.pdf> accessed on 02.09.2016)

3.4.1. Challenges to address the constraints

The information and communications technology (ICT) sector in Bangladesh is flourishing and is offering both well paid and highly skilled jobs. But the future success of the sector depends largely on the ability of attracting both visionary entrepreneurs and qualified employees. Currently, there are only a handful of female entrepreneurs in the Bangladeshi software industry and there is a chronic underrepresentation of female workers, managers and business owners throughout the sector. Motivating and attracting women is a challenge.

The challenge to motivate women to choose ICT as a career is, however, a worldwide problem. According to a research paper by Klara Nelson and Natasha Veltri, two academics, vocational interests appear to play a crucial role in gender-occupational choices and gender disparity in the ICT field. Where women tend to choose people-oriented careers, men gravitate towards object-oriented careers.

As part of the Bangladesh IT Management Programme (BITMAP), a brain-storming session was held among key female role models — largely CEOs and entrepreneurs — to identify both the key challenges and what attracts and motivates women to work in the ICT industry. They identified that creating awareness, motivating for ICTs career and providing cyber security are the key supports to women in ICTs.

After all the discussions, it can be said that in this chapter the related issues of women's access and e-governance have been discussed. The scenario of digital gap, recent policy initiatives in both rural and urban areas have been presented. In the next chapter, the data will be presented for building correlations to prove the conceptual framework.

Chapter four: Research findings

4.1. Introduction

Prior to survey I have incorporated some theoretical discussions for in-depth searching of the research objectives. On the basis of the data and the theoretical part, discussion of collected data has been incorporated in this chapter. Three different study areas of Bangladesh have been selected for data collection. These areas present the scenario of rural and urban areas of Bangladesh. As gender role theory has been taken to explore the influence of women's access on e-governance, data have been presented quantitatively. The variables have been focused in the questionnaire and data collection. The data have been collected from different age groups of women, various social spheres, various professions and also some ICT experts (Those who provide trainings to women on ICTs and ICT entrepreneurs). It is necessary to mention that, research findings have been presented in a blended method like- general women respondent's opinions have been presented quantitatively (in number and percentage). On the other hand, opinions of trainers, practitioners and experts have been presented qualitatively as observation and suggestion.

Before moving towards main discussion number of total respondents for the study has been mentioned below in a table. The total number of respondent is 50 at Manda, the number of expert respondent is 25. At Kashipur the number of total respondent is 130. At Joshodol the number is 61. Among female respondents, there are women of different professions, housewives, students, etc.

Research questions have been explained to the respondents in Bengali language, so that they find it easier. To make an in-depth interview some respondents were asked to provide examples.

Table 4.1: Respondents for the study

The following table shows respondents from Manda, Kashipur and Joshodol.

Respondents	Kashipur	Manda	Joshodol
Female	100	50	50
Trainer/ practitioner	15	10	05
Expert person	15	15	06
Total	130	75	61

The number of respondents has been selected in ratio of total female population. The number of women respondents who are inhabitants of these areas is 100 at Kashipur, 50 at Manda and 50 at Joshodol. Some 66 practitioners, experts, entrepreneurs and trainers have been interviewed. Among the 66 respondents, 28 were IT trainers of Jubo Unnoyon Odhidoptor, 11 respondents were ICT teachers in vocational schools, colleges and Primary teacher training institutions. Entrepreneurs (6 respondents) who have ICT farms, companies etc. were interviewed. Another 16 respondents who works at ICT companies have given their opinions. And 5 researchers have been interviewed to get the overall scenario of women's access to ICT.

4.2. Supporting women in ICTs:

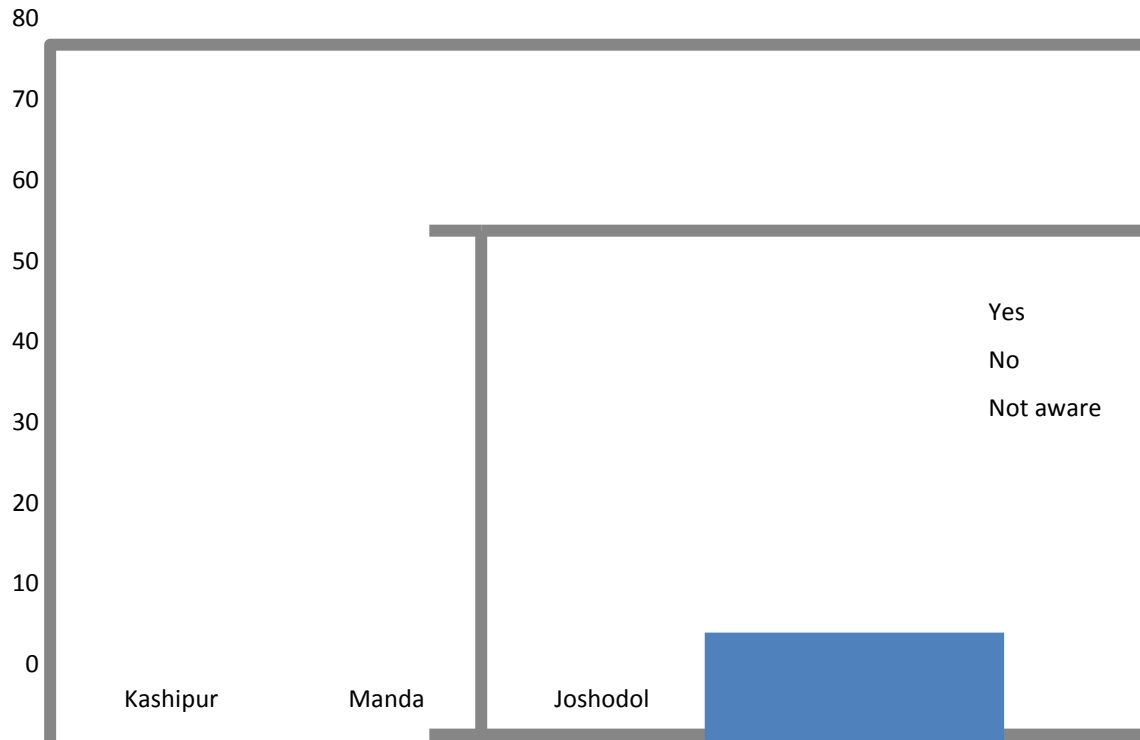
The major objective of the study is to identify the ways of supporting women. A study in one hand recommends that technology access needs to play itself out in the context of social inclusion. Bangladesh can ...explore approaches based positive experiences of women workers in ICT sector. On the other hand, it says that we need to be alert to the reality that ICTs can reinforce gender differences or can help to overcome them (Nidhi Tandon, 2006). On the basis of the support to women in accessing to ICT, E-governance may be accelerated. Supporting women will be analyzed below with some indicators. These are:

- 1) ICT policy
- 2) Socio-economic and cultural factors
- 3) Digital literacy
- 4) Availability of ICT tools
- 5) Formal education
- 6) Women entrepreneurs related to ICTs
- 7) Digital security

4.2.1. ICT policy:

Despite a number of international consultations on ICT and gender policies and the acknowledged need for a policy framework on ICT and gender, in reality gender concerns and initiatives continue to remain an after-thought. Bangladesh's National Information and Communication Technology (ICT) Policy has outlined a number of measures for the introduction of ICT education in public and private universities, teachers' training in ICTs, deployment of virtual ICT teachers and web-based course work. There is no mention, or indication, about how these measures will address the barriers to gender equality and education. The policy document also mentions that cyber kiosks will be set up in all post offices and local government centers. In a study it is identified that public spaces are highly unlikely to be frequented by rural women. This is because cultural and social restrictions on women tend to prevent them from entering public spaces. While the policy focuses on the growth of export-oriented software industry, there is little attention given to the access and usage by women or their ICT needs (Nidhi Tandon, 2006). Moreover, most of the women, especially at rural areas don't know about recent ICT initiatives.

Figure 4.1: Response about access to ICT and existing policy



- Respondents were asked that, if they have any comment about existing national ICT policy and supporting access of women at both rural and urban areas of Bangladesh. Most of the respondents, respectively 72 at kashipur, 35 at Manda and 42 at Joshodol expressed that they think policy framework and implementation enhance support to women in accessing ICTs.
- A little number of respondents, 18 at Kashipur, 7 at Manda and only 6 at Joshodol opined that access to ICT is not influenced by Policy. Whereas, 10 respondents at Kashipur, 8 at Manda and 2 at Joshodol are not even aware of ICT policy and they had no comments about supporting women in ICTs.

Table 4.2: Respondents in three different areas

Access to ICT	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%(Average)
Aware of and use cyber kiosk and UDC	60	60	35	70	28	56	123	62
Not aware about recent policy initiatives	25	25	06	12	14	28	45	21.66
Don't have any interest	15	15	09	18	08	16	32	16.34
Total	100	100	50	100	50	100	200	100

- Among 100 respondents of Kashipur, 60% women are aware about recent policy initiatives, while 25% women are not familiar to the cyber kiosk and Union Digital center. Most of the respondents think that policy initiatives like- cyber kiosk at post office, Union Digital centre, etc. are support to women. This scenario presents that initiatives encourages women's access to ICT.
- At Manda, 70% respondents are aware of Cyber kiosk in post offices and UDCs. But 12% women do not know about and use these privileges. Respondents think that if women are aware of these initiatives, they will avail those.
- At Joshodol, 56% respondents have knowledge about ICT policy. On the other hand, 28% women do not know about the initiatives. Overall scenario is that, 62% respondents

are aware of necessity of gender supportive policy, 21.66% are not aware of these services and 16.34% have no interest for such privileges.

Table 4.3: Statistical value for aware of policy initiatives

Statistical function	Results
Correlation	The value of the correlation of the two factors, awareness about policy initiatives and access to ICT is 0.98402 in study areas. So data result shows positive relation between policy initiatives and access to ICT in study areas.

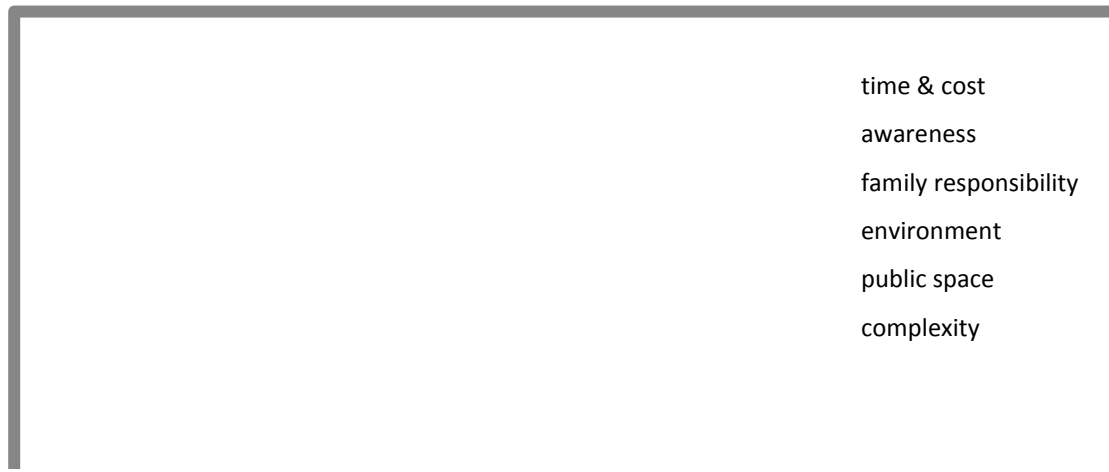
From above data presentation, it is clear that there is a positive relation between policy initiatives regarding women and ICT. Most of the women respondents think that appropriate policy creates environment for access to ICT.

4.2.2. Socio-economic and cultural factors:

As male group of the society can avail the web access facility from commercial centers or outside the home but the local women community of Bangladesh has limited access due to some social and cultural environment. Unfortunately, due to family obligation and service, they can't spare sufficient time for using the net (Md. Shahid Uddin Akbar, CEO, womenBD.com).

On the other hand, the economic condition of the people is one of the vital issues for computer use and internet connectivity. Generally, on average wealthy and educated as well as young, urban and male have the internet access, which appears that economic solvency and education are the major factor during internet diffusion. Most of which are not favorable in Bangladesh (Md. Shahid Uddin Akbar, CEO, womenBD.com).

Figure 4.2: Socio-economic and cultural factors



The findings of the figure reveal that 46% respondents' family responsibility is the major factor behind access and usage of ICTs. Another 12% respondents think that awareness, 18% respondents say time and cost, 8% says complexity of using ICT tools, 6% due to public space and 10% says that working environment are the major factors behind level of access to ICT.

Variation of access to ICT depends on socio-economic and cultural practice. Here, time and cost of using ICT tools, awareness of women, family responsibilities related to child and household works, working environment, frequent access to public space and complicity regarding language, usage and applications, etc. are considered as major factors effecting access and control of ICT tools by women. The following data will show these factors:

Table 4.4: Relation with access to ICT and social factors of respondents

Access to ICTs	kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
Time and cost	20	20	6	12	7	14	33	15.34
Family responsibility	46	46	16	32	32	64	94	47.34
Awareness	12	12	5	10	4	8	21	10
Public Space	6	6	11	22	3	6	20	11.33
Complexity	6	6	8	16	2	4	16	8.66
Environment	10	10	4	8	2	4	16	7.33
Total	100	100	50	100	50	100	200	100

- At Kashipur 46% claims family responsibility is the major socio-economic and cultural factor affecting access to ICT. At Manda 32% women and at Joshodol 64% women think family responsibility as the most influential factor.
- Among 200 respondents 15.34% opines that ICT tools are time and cost consuming, 10% says that they are not familiar to usage of ICTs, 11.33% avoid public spaces, 8.66% assumes ICT tools as complicated and 7.33% women think that there is no proper environment of access and usage.

Most of the respondents think that social and cultural obligations are influential factors behind women's psychological set-up for access and control of ICT tools. Women in rural areas opined that they have low income and rigid cultural obligations, these factors affect usage of ICT tools.

Table 4.5: Statistical value for socio-economic and cultural factors

Statistical function	Results
Correlation	The value of the correlation of the two factors, socio-economic and cultural factors and access to ICT is 0.99483 in study areas. So data result shows positive relation between social, cultural, economic factors and access to ICT in study areas.

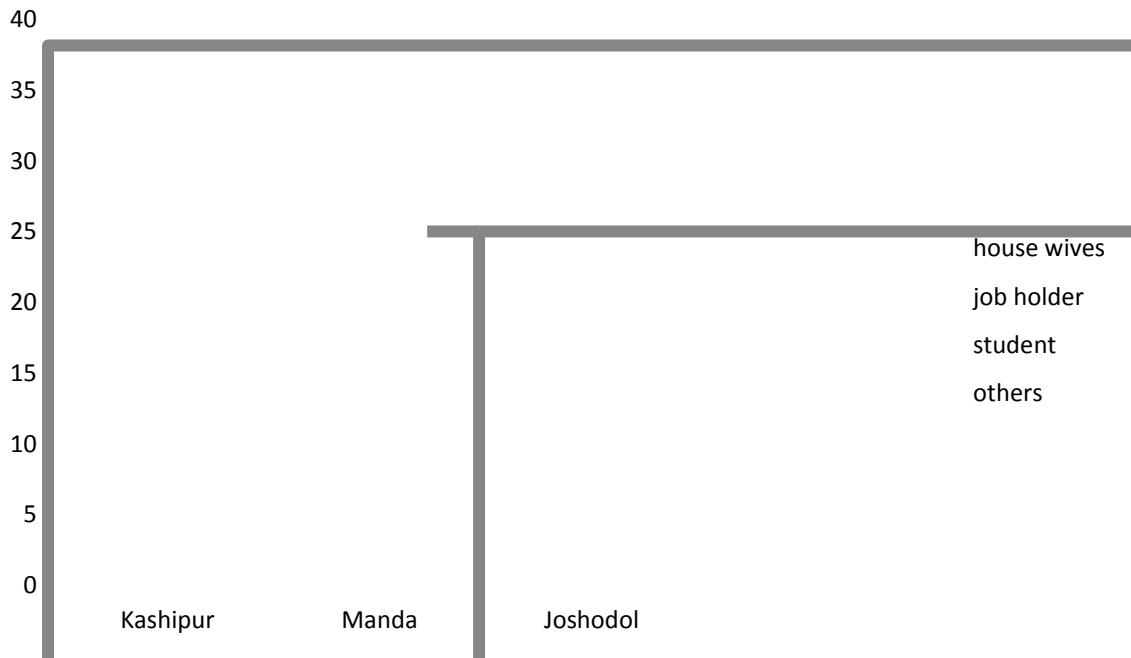
The above findings show that there is a strong positive relation between access to ICT and women's socio-economic and cultural factors. In rural area, 64% of respondents opined that family responsibility are constraints for access to ICT and most of the women do not feel much necessity of using ICT tools as they find it more complicated. The data presents that these factors are more influential in rural areas.

4.2.3. Digital literacy:

Bangladesh is facing acute crisis of skilled computer user due to literacy problem. Information in the net is designed in the advance technology, which requires adequate knowledge for the user (Md. Shahid Uddin Akbar, CEO, womenBD.com).

Digital literacy has been not so familiar to women especially rural women. In this context, various respondent like- house wives, students, job holders and other professionals were interviewed. Most of the respondents think that digital literacy is very necessary for regular user of ICT tools. The following data presents if there is any relation between digital literacy and access to ICT tools.

Figure 4.3: Digital Literacy



- Among 100 respondents of Kashipur, 35 were house wives, 35 students, 15 job holders related to ICT and 15 others (illiterate/ unemployed/single, etc.) were interviewed.
- Among 50 respondents 15 were house wives, 10 job holders, 10 students and 15 experts at Manda. Whereas, at Joshodol, 19 house wives, 5 job holders, 20 students and 6 experts were interviewed.

Digital literacy is one of the major factors of digital gap. The value of physical access is gained only if women are provided with basic computer literacy (Nidhi Tandon, 2006). In this study, it is found that respondents of urban areas are more concerned about digital literacy. But in rural areas the women know a little about such literacy.

In the following table, the variables- digital literacy and access to ICT are incorporated.

Table 4.6: Level of digital literacy

Access to ICT	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
Highly literate	26	26	5	10	9	18	40	18
Moderately literate	59	59	38	76	39	78	136	71
Not familiar to usage	15	15	7	14	2	4	24	11
Total	100	100	50	100	50	100	200	100

- Respondents were asked about digital literacy. According to 71% respondents they use ICT tools without any knowledge on digital applications, security, etc. Among 200 respondents, 11% are not even familiar to usage of tools.
- Digital literacy is only familiar to trainers and experts of study areas, which is shown in above figure. Most of the respondents opined that regular use of ICT tools like-mobile, computer etc. are sometimes affected by lack of literacy.

From the above table, the author has come to the decision that the digital literacy has a relation with access to ICT. If the comparison comes among literacy level, it can be said that digital literacy influences involvement with organization but not informal usage of ICT. Rather regular use is more influential.

4.2.4. Availability of ICT tools:

Availability of ICT tools are the main factor behind supporting women. The main obstacle to using the internet in Bangladesh is its distribution. The internet is still an urban privilege because telephone connections are more concentrated in urban areas, particularly in and around Dhaka.

Mobile operators are providing substantial service in and outside urban areas using 3G/ EDGE or WiMAX.

Available ICT tools encourage women’s use and control. The following table shows the level availability in the study areas. The relation between access to ICT and availability of ICT tools has been identified. In study areas there is difference in infrastructure. At Kashipur, Manda and Joshodol respondents were asked to select the level of availability of ICT tools.

The respondents chose the level according to their area and how often they use these tools. In a study on Barisal district it was found that, only 13% area is covered by 3G networks (Tasnuva, 2014). The comparative scenario is presented below:

Table 4.7: Availability of ICT tools

Access to ICT	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
Modern & Available ICT tools	59	59	19	38	14	28	92	41.67
Moderately available	31	31	21	42	29	58	81	43.67
Limited and not continuous	10	10	7	14	6	12	23	12
Not available	0	0	3	6	1	2	4	2.66
Total	100	100	50	100	50	100	200	100

- Among respondents of urban areas (Manda and Kashipur), respectively 59% and 38% opines that ICT tools in these areas are modern and available enough. Another 28% at rural area (Joshodol) says that ICT tools are available.

- On an average, 12% respondents do not find ICT tools continuous and limited. 2.66% respondents say that such tools are not available. Availability of such tools effect access to ICT tools.
- From above table it is clear that ICT tools are comparatively more available and modern in urban areas (Kashipur and Manda). But most of the respondents expressed that the frequency is not good at all in rural areas. According to ICT experts, practitioners, trainers and entrepreneurs, availability is the first priority for supporting women in ICTs.

Table 4.8: Statistical value for availability of ICT tools

Statistical function	Results
Correlation	The value of the correlation of the two factors, availability of ICT tools and access to ICT is 0.89257 in urban areas. Correlation between the two factors in rural area is 0.45037. So data result shows a positive relation between availability of ICT tools and access to ICT in study areas.

The above result provides a different scenario of urban and rural areas which has a strong relationship with access to ICT by women. Availability of ICT tools and infrastructure is an influential factor in accessing ICTs.

4.2.5. Formal education:

Education is the key to addressing entrenched discrimination. Bangladesh has made immense gains in girls' education. Girls now outnumber boys in primary and secondary schooling.

However, net attendance rates in secondary schools are still extremely low, at only 53 % for girls and 46% for boys. In tertiary education, there are only six girls for every 10 boys. (http://www.unicef.org/bangladesh/Women_and_girls_in_Bangladesh.pdf accessed on 29.06.2016)

If women’s access in ICTs is to be enhanced, education level is to be enhanced, especially in rural areas. In this study women from various social spheres have been interviewed, so that education level can be compared realistically. The following data shows area specific literacy level of respondents in three study areas. It only demonstrates the level of general respondents excluding experts and professionals.

Table 4.9: Relation with formal education and access to ICT

Access to ICT	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
Illiterate	1	1	2	4	2	4	5	3
Literate	7	7	5	10	4	8	16	8.34
Primary education	7	7	10	20	5	10	22	12.33
SSC	23	23	15	30	12	24	50	25.66
HSC	25	25	8	16	10	20	43	20.33
Graduate	15	15	5	10	10	20	30	15
Masters	20	20	5	10	5	10	30	13.33
Technical education	2	2	0	0	0	0	2	0.67
Others	0	0	0	0	2	4	2	1.34
Total	100	100	50	100	50	100	200	100

- The percentage of respondents in the level of SSC is 23% at Kashipur, 30% at Manda and 24% at Joshodol. The highest percentage is of SSC 30% at Manda. A little number has technical education. The respondents opined that education influences usage of ICT tools.
- Among total respondents 3% are illiterate and 8.34% are literate. Another 12.33% have gone through primary education. It is noted that, the rate of illiteracy is more in rural area

and higher education rate is more in urban areas. Education encourages women's access to ICTs.

- Other education includes self-education, vocational trainings, etc. In the study two respondents have been categorized as others who received vocational training. Above data shows that level of education is higher in urban areas than rural area. According to respondents educated women are able to use ICT tools and control.

The following table shows the relation between education and access to ICT both in urban and rural area:

Table 4.10: Statistical value

Statistical function	Results
Correlation	The value of the correlation of the two factors, formal education and access to ICT is 0.27735 in urban areas. Correlation between the two factors in rural area is 0.62862. So data result shows a positive relation between education and access to ICT in all study areas.

The above finding provides result that the higher the education, higher the access to ICTs.

Formal education influences the access of women in ICTs.

4.2.6. Women entrepreneurs related to ICTs:

The Asia Foundation, in collaboration with the country's second largest telecom operator, Banglalink, is designing an ICT based solution that capitalizes on the country's phone subscribers to help these entrepreneurs overcome common barriers. Launched at a forum in Dhaka, the initiative will connect women entrepreneurs in the rural areas- where the majority of the population still live. It will create a mobile phone-driven network and delivering ICT based

business tools and service. By building a network among them, women entrepreneurs will be able to share experiences and gain better access into the booming ICT sector, receive ICT training and be prepared to benefit from e-government initiatives that government is currently implementing. Under this initiative, women entrepreneurs will have a dedicated platform (bdwomensme.org) to sell their products and take advantage of the e-marketplace (<http://asiafoundation.org/2014/05/14/ict-innovations-connect-bangladeshs-women-entrepreneurs/> accessed on 29.09.2016).

To find out the influence of entrepreneurship on access to ICT, in this study it is identified that through entrepreneurship economic empowerment can be achieved. Moreover, respondents advocated that through use of ICT they are able to receive foreign remittance easily, create self-employment and get ICT training. Some respondents opined that involvement with business, communication skill, involvement in ICT related jobs, etc. are influenced by usage of ICT.

Table 4.11: Women entrepreneurs related to ICTs

Access to ICT	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
Economic Empowerment	7	7	3	6	4	8	14	7
Beneficiary of Foreign Remittance	28	28	14	28	13	26	55	27.33
Employment	33	33	10	20	10	20	53	24.33
ICT training	10	10	5	10	3	6	18	8.66
Involvement with business	12	12	8	16	10	20	30	16
Communication Skill	5	5	5	10	5	10	15	8.34
Involvement in ICT Sector	5	5	5	10	5	10	15	8.34
Total	100	100	50	100	50	100	200	100

- Respondents were asked if they think that access to ICT is linked to women empowerment and entrepreneurship. The above table shows that, 7% respondents think that economic empowerment influence access to ICT. Among respondents 27.34% opines that foreign remittance influences women’s access to ICT.
- Employment and involvement with jobs is a factor for access to ICT- said 24.34% respondents. In both urban and rural areas, 8.67% respondents expressed that training related to ICT can enhance access to ICT.
- Women entrepreneurs, according to 16% women cause more access to ICT for their business activities. The percentage is higher in rural areas. Another 8.34% respondents advocates that communication skill and entry in ICT sector encourages access to ICT.

Table 4.12: Statistical value

Statistical function	Results
Correlation	The value of the correlation of the two variables, entrepreneurship and access to ICT is 0.99902 in study areas. So data result shows a positive relation between entrepreneurship and access to ICT in all study areas.

In the above discussion there are relationships between women entrepreneurship and access of ICT.

A case study is given below to describe the opinion of respondent:

Box 4.1: Case study about women entrepreneurs

Sania Akhter, resident of Kashipur, Barisal Sadar have said that she passed BA from national university. When she was student, used to enjoy games, listened to songs and communicate with relatives through mobile phones. After graduation, she introduced a boutique shop and she feels how necessary ICT is. She created a website for her shop and collect orders through that. As an entrepreneur she would like to accelerate her business through usage of ICT. She says- the more I use ICTs, more I am in the network of clients. I feel safe in dealings.

4.2.7. Digital security:

Most of the developing countries like Bangladesh have limitations of access to information and available access is not affordable because of the inadequacy of existing infrastructure. The challenges are posed by the lack of an integrated computer security system and education about computer security. There is a need for collaboration, cooperation and investment for security (http://www.itu.int/osg/spu/cybersecurity/contributions/Bangladesh_Salim_paper.pdf accessed on 29.06.2016).

In the following table, relation between digital security and access to ICT has been shown. According to 22% women of Manda, cyber security is a factor behind access to ICT. On average 18% respondents are familiar to cyber security. On the other hand, 8% women have not even listened about it.

Table 4.13: Relation with digital security and access to ICT

Access to ICT	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
Cyber security	22	22	10	20	6	12	38	18
Fear of hacking	29	29	14	28	9	18	52	25
Misuse of ICT tools	39	39	20	40	30	60	89	46.34
Lack of legal support	12	12	4	8	9	18	25	12.67
Not aware	8	8	2	4	6	12	16	8
Total	100	100	50	100	50	100	200	100

- Misuse of ICT tools has been the highest (60%) concern even in rural areas. Lack of legal support on various offenses is also affecting access to ICT by women. On the other hand, 46.34% respondents think that misuse of ICT tools affect appropriate usage of ICTs. Another 12.67% women opine that there is lack of women friendly law and legal support.
- Among 200 respondents 29% respondents of Kashipur says that fear of hacking websites, e-mails and social networks are also influential factors. Whereas, 28% respondents at Manda expresses in the same way and 18% respondents at Joshodol also consider this as a part of digital security concern. In this study, respondents were asked to mention cyber security factors like- cybercrime, fear of hacking, misuse of ICT tools, lack of legal support, etc. Some of the respondents (8%) are not even aware of cyber security.

The following table shows correlation between digital security and women's access to ICT below:

Table 4.14: Statistical value

Statistical function	Results
Correlation	The value of the correlation of the two variables, digital security and access to ICT is 0.85044 in both urban and rural areas. So data result shows a positive relation between digital security and access to ICT in all study areas.

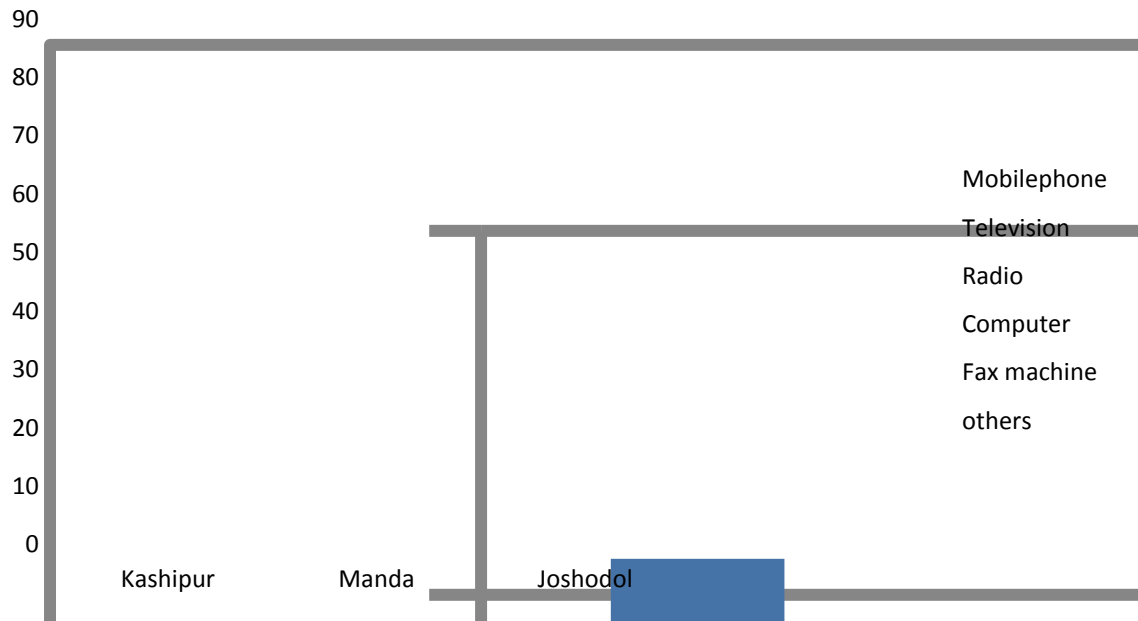
From the above finding it can be said that digital security is influential in both urban and rural areas. Lack of digital security is one of the major factors behind less access to ICTs.

4.3. Access to ICT in urban and rural areas:

Access to ICT may be a step toward achieving e-governance if both rural and urban areas are developed equally. In Bangladesh besides urban areas there have been a number of projects introduced by government and NGOs, like- e-krishok, batighar, e-clinic, etc. to develop rural areas. But still the scenario of rural areas is different especially in case of women's access to these arrangements.

In the following figure a trend of ICT tools usage in both urban and rural areas is presented:

Figure 4.4: Highest usage of ICT tools at urban and rural areas



- Respondents were asked about highest usage of various ICT tools in their regular livelihood. At Manda, 81% respondents use mobile regularly, whereas at Kashipur, 79% respondents use mobile in their daily lives. At Joshodol, 60% respondents expressed highest use of mobile phones.
- Among 100 respondents of Manda 15% respondents use television regularly, 20% respondents of Kashipur use television and at Joshodol 34% respondents use television regularly.
- Another 1% and 3% women of Manda and Joshodol use radio regularly. On the other hand only 3% at Manda, 1% at Kashipur and 2% at Joshodol use computer, laptop, I-pad, etc. highly and regularly.

From the above figure it can be said that mobile phone/ Land phone is being used in a huge number. On the other hand, other ICT tools are used only by a few. It is to identify that how these devices are used. The following table shows the popular use of mobile phones by women:

Table 4.15: Access to mobile/ Telephone in urban and rural areas

Access to ICT tools	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
For communication & information	21	21	20	40	21	42	62	34.34
For entertainment	54	54	20	40	25	50	99	48
For e-service	5	5	0	0	2	4	7	3
For mobile banking	12	12	5	10	1	2	18	8
For learning	2	2	1	2	0	0	3	1.33
For easy livelihood	6	6	4	8	1	2	11	5.33
Total	100	100	50	100	50	100	200	100

- From above table it is seen that 34.34% respondents use Mobile/Telephone for communication and gathering information.
- Among 100 respondents at Kashipur, 54 use mobile phone for entertainment, like-gaming, listening to songs, browsing, chatting, etc. 5 respondents use mobile for e-services like- health queries, online shopping, e-education, etc. While 12 women use it for mobile banking in transferring money, paying bills, transacting through internet and others. Another 2% women use mobile for learning and 6% women said that mobile phone made their daily works easier and comfortable.

Box 4.2: Usage of mobile in regular livelihood

Mst. Sabina Yasmin, Age-32 years, a working woman, advocates that multifaceted use of mobile has made her life more comfortable. She has to maintain her family responsibilities like- paying electricity bills, bringing goods for daily consumption and also her job. According to Yasmin- all these would be difficult if she had not taken the advantage of ICT. She pays bill through mobile, make online shopping and other daily functions. She also mentioned that, if anyone wants, through use of ICT can make life easier and comfortable.

- Among 50 respondents of Manda, 40% use mobile for communication, 40% women use mobile for only entertainment, 2% women use it for receiving e-learning, 10% use mobile for mobile banking and 8% women use mobile for easy livelihood.
- On the other hand, at Joshodol 42% respondents use mobile for communication, 50% women use mobile for entertainment, 4% use for availing e-services, 2% use for mobile banking and 2% women use it for easy livelihood.

From above discussion it is identified that though mobile has various usage but most of the woman are using for entertainment and communication. In this segment access to ICT will be analyzed. Percentage of respondents accessing ICTs will indicate the impact level on e-governance. Not only measuring access, here two controlling variables have been added those are - rural and urban areas.

Table 4.16: Overall access to ICT by women

Access to ICT	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
High access to ICT tools	10	10	4	8	4	8	18	8.67
Moderate usage	64	64	24	48	26	52	114	54.67
Low use of ICTs	16	16	11	22	12	24	39	20.66
No use at all	10	10	11	22	8	16	29	16
Total	100	100	50	100	50	100	200	100

- From the above table it is seen that on an average only 8.67% women highly use ICT tools. Most of the women use ICT tools irregularly and 20.66% women use ICT hardly. 16% women do not have control on ICT tools. Among 200 respondents at urban areas respectively 64% and 48% use ICT tools, at rural area 52% women use ICT tools.

Respondents were asked to choose a level of women's access to ICT. The data presents that level of access is different in urban and rural areas.

Table 4.17: Statistical value

Statistical function	Results
Correlation	The value of the correlation of the two variables, Study area and respondents is 0.99902 in urban areas.
	Correlation between the two factors in rural area is 0.99068. So data result shows a positive relation between study areas and access to ICT in all study areas.

After the above discussion we can conclude that in the rural areas the percentage of women's access to ICT is comparatively low than in urban areas.

4.3.1. Transforming gender role:

Duncombe (2006) contributes to hypothesize about ICT and its association to progress by applying "livelihood" approach. It takes rural micro-enterprise as a significant prospective area of ICT application. A vital ending of the study is that it provides some clue that ICTs are playing a major role in lives of the countryside poor

(http://paper.ijcsns.org/07_book/201411/20141112.pdf accessed on 26.06.2016).

Respondents have been asked if access to ICT has potentiality to transform their role. Some common indicators have been identified by respondents- role in decision making, involvement with formal organization, role in sharing knowledge, increased awareness, financial contribution (income). In the following table relation between two variables access to ICT and gender role is presented:

Table 4.18: Gender role in urban and rural areas

Access to ICT	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
Decision making	36	36	8	16	9	18	53	23.34
Involvement with organization	19	19	6	12	6	12	31	14.33
Knowledge management	16	16	11	22	5	10	32	16
Increase awareness	11	11	8	16	10	20	29	15.67
Self- employment	8	8	5	10	15	30	28	16
Contribution in governance	10	10	12	24	5	10	27	14.66
Total	100	100	50	100	50	100	200	100

- From the above table we can see impact of access to ICT on gender role.

According to 36% respondents of Kashipur, decision making role of women is influenced by use ICT, 19% women opined that access to ICT influence involvement with organization, 16% respondents gather knowledge through ICT, 11% women become aware through ICT, 8% women thinks that self-employment is influenced by ICT and 10% women expressed that access to ICT can contribute in e-governance.

- Among 50 respondents at Manda, 16 % respondents make decisions with help of ICT, 12% women said that access to ICT influence involvement with organization, 22 % respondents collect knowledge through ICT, 16% women thinks that ICT increases awareness, 10% women are self-employed through ICT and 24% women said they would like to contribute in e-governance.

- On the other hand, 53% women think that through ICT decision making will be easier and only 10% women would like to contribute in governance through ICT. So, there is a different scenario of gender role in urban and rural areas.

Box 4.3: Gender role influenced by access to ICT

Shahnaz Akhter, Age-40 years, inhabitant of Joshodol expressed that, use of mobile and computer is now part of daily life. Without these devices I cannot even carry out my responsibilities. She added that by using computer she has added value to her job, she takes care of her daughter through mobile. Even use of ICT has reduced time consumption in case of sending money to her son living outside the home. She said that, proper use of technology encourage women’s role.

From collected data it is clear that control and use of ICT tools have potentiality to transform gender role both in rural and urban areas. More involvement in ICT related organization, self-employment, knowledge management, increased awareness and participation in decision making will enhance women’s role in e-governance. The following table shows correlation between transformation of gender role and access to ICT:

Table 4.19: Statistical value

Statistical function	Results
Correlation	The value of the correlation of the two variables, gender role and access to ICT is 0.98885 in study areas. So data result shows a high positive relation between women’s role and access to ICT in study areas.

At the end, it can be said that, there is difference in relation between gender role of rural area and that of urban areas. But the result shows commonly that, the more women's access to ICT, the more effective women's contribution in e-governance.

4.3.2. Empowerment

A UNESCO report on “Gender Issues in the Information Society” stated that the capability of women to use information through ICT is dependent on many social factors, including literacy and education, geographic location, mobility and social class. In the process of women empowerment, the ICTs play a major role especially through technologies like cell phones and the internet. The cell phone is an extremely efficient ICT for the empowerment of women. It has been accessed by the majority of the people, rural and urban, rich and poor, educated and uneducated, because of its features. But still use of internet by rural women is not satisfactory.

Technological development is an urgent requirement for the socio and economic empowerment of rural women. However, individual attitudes, social changes and interest in accessing ICTs are also becoming increasingly important issues in the technology-based empowerment of rural women. Any technological empowerment related initiatives should identify the significant needs of rural women in the information world ([http://www.vri-online.org.uk/ijrs/Oct2013/Socio-Economic%20Empowerment%20of%20Rural%20Women%20through%20Information%20and%20Communication%20Technology%20\(ICTs\).pdf](http://www.vri-online.org.uk/ijrs/Oct2013/Socio-Economic%20Empowerment%20of%20Rural%20Women%20through%20Information%20and%20Communication%20Technology%20(ICTs).pdf) accessed on 30.09.2016).

In the following table, impact of ICT equipped women on empowerment has been measured:

Table 4.20: Empowerment and women's access to ICT

Impact on empowerment	Kashipur	Manda	Joshodol	Total
High impact	61	31	19	111
Moderate impact	23	16	29	68

Less impact	11	3	2	16
No impact	5	0	0	5
Total	100	50	50	200

- In the questionnaire respondents were asked to mark the rate of empowerment with 1(no impact), 2(less impact), 3(moderate impact) and 4(high impact).
- At Kashipur, 61 respondents opined that access to ICTs would highly influence empowerment, 23 respondents think use of such tools will moderately influence women's empowerment, 11% women said, there will be less impact and 5% women think there will be no impact on empowerment.
- At Manda most of the respondents expressed that more access will influence empowerment more and at Joshodol 29 respondents think that use of ICT will moderately influence empowerment.

Table 4.21: Statistical value

Statistical function	Results
Correlation	The value of the correlation of the two variables, empowerment and access to ICT is 0.99844 in study areas. So data result shows a very strong positive relation between empowerment and access to ICT in all study areas.

So the result shows that women empowerment is related to access and support in ICTs. If the women are ICT equipped, they will be empowered.

4.3.3. Involvement with organization

Rural women spend more time than urban women and men in reproductive and household work, including time spent obtaining water and fuel, caring for children and the sick, and processing food. This is because of poor rural infrastructure and services as well as culturally assigned roles that severely limit women's participation in employment opportunities.

(<http://www.un.org/womenwatch/feature/ruralwomen/facts-figures.html> accessed on 25.06.2016).

Respondents were asked if they think that access to ICT and support would encourage involvement with organization. The following table shows two variables involvement with organization and access to ICT:

Table 4.22: Involvement with organization

Involvement with organization	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
Yes	62	62	38	76	41	82	141	73.34
No	38	38	12	24	9	18	59	26.66
Total	100	100	50	100	50	100	200	100

- From the above table 62% respondents opined that access to ICTs encourages organizational involvement. In total 73.34% women think that use of ICT increases organizational involvement. Among 200 respondents 26.66% women think that there will be no impact of access to ICT on involvement in various organizations.
- Some respondents expressed that involvement in various organization is much influenced by access to ICT, because communication, information and sharing knowledge are ways to get involved with ICT related organizations.

Table 4.23: Statistical value

Statistical function	Results
Correlation	The value of the correlation of the two variables, involvement with organization and access to ICT is 0.9934 in both urban and rural areas. So data result shows a strong positive relation between involvement with organization and access to ICT in all study areas.

The above statistical value indicates that access to ICT enhances involvement with formal organizations, especially organizations related to ICTs. Women's involvement would be encouraged if they get more access and support in ICTs.

4.3.4. Skill of information and communication

Compared to other countries in the region, Bangladesh has not used ICTs for networking among women organizations to its full potential. Women who work within ICT need to build networks, skills and confidence in order to overcome isolation and progress (Faulkner 2004). ICT can improve their skill of communication and access to information.

In this portion, relation between skills of information and communication and impact of ICTs has been measured. Respondents were asked to choose the level of impact of access to ICTs on information and communication skills. The following table shows impact of ICT on communication skill:

Table 4.24: Skills of information and communication

Impact of ICTs	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%

Highly skilled	23	23	17	34	19	38	59	31.67
Moderately skilled	71	71	28	56	29	58	128	61.67
Less skilled	6	6	5	10	2	4	13	6.66
No impact	0	0	0	0	0	0	0	0
Total	100	100	50	100	50	100	200	100

- Among 200 respondents none think that access to ICT will not influence communication skill. Most of the respondents (61.67%) think that women's communication skill will be encouraged through ICT.
- Another 31.67% women expresses that if they have access to ICT, they will be highly skilled in communication and information. The above data shows that women can be skilled in information and communication through proper access and support in ICTs. The following table presents relation between communication skill development and access to ICT:

Table 4.25: Statistical value

Statistical function	Results
Correlation	The value of the correlation of the two variables, communication skill and access to ICT is 0.99979 in study areas. So data result shows a high positive relation between communication skill and access to ICT in all study areas.

From above discussion, the author came to decision that access to ICT influences information and communication skill.

4.3.5. Involvement in ICTs

Information technology is regarded as a representation of the conditions and parameters effecting the transmission and processing information. Communication and human resource development are interwoven. The ultimate goal of communication is to bring about which is the one of the phenomenon that is permanently especially in the desire direction of the person who receives the communication (Park, 2007) - retrieved from <http://articlesng.com/information-communication-technology-human-development-nigeria/> on 29.06.2016.

Respondents were interviewed on access to ICT and involvement in ICTs. They have been provided two options- yes or no. The following table shows the impact of ICT and involvement with ICT related job:

Table 4.26: Involvement in ICT related job

Impact of ICT	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
YES	77	77	36	72	37	74	150	74.33
NO	23	23	14	28	13	26	50	25.67
Total	100	100	50	100	50	100	200	100

- Among 200 respondents 25.67% respondents think that only access to ICTs will not increase involvement in ICT related job. On the other hand, most of the respondents (74.33%) said that, more access to ICT will ensure more involvement in ICT related jobs.
- Most of the respondents in urban areas opine that ICT related jobs are more technological and require higher education. In rural areas there is not enough demand for ICT related jobs as they lack ICT related education. Respondents were asked if *supporting women in ICT usage make them more efficient and involve with organization.*

Table 4.27: Statistical value

Statistical function	Results
Correlation	The value of the correlation of the two variables, involvement in ICTs and access to ICT is 0.99977 in study areas. So data result shows a strong positive relation between involvement in ICT and access to ICT in all study areas.

From above discussion it can be said that access to ICT accelerates involvement in ICT related jobs, like- outsourcing.

4.3.6. Digital divide

The term “digital divide” refers to the differences in resources and capabilities to access and effectively utilize ICT for development that exist within and between countries, regions, sectors and socio-economic groups. The digital divide is often characterized by low levels of access to technologies. While there is recognition of the potential of ICT as a tool for the promotion of gender equality and the empowerment of women, a “gender divide” has also been identified, reflected in the lower numbers of women accessing and using ICT compared with men (<http://www.un.org/womenwatch/daw/public/w2000-09.05-ict-e.pdf> accessed on 29.06.2016).

To identify the relation between access to ICT and reducing digital divide is shown below:

Table 4.28: Digital Divide

Access to ICT	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
Brings equality in collecting information and storage	11	11	9	18	10	20	30	16.34
Value added and sophisticated jobs	53	53	31	62	18	36	102	50.34
Ensures ICT jobs	18	18	7	14	12	24	37	18.66
Control of ICT tools	18	18	3	6	10	20	31	14.66
Total	100	100	50	100	50	100	200	100

- At Kashipur, 11% women think that access to ICT brings equality in collecting information and storage and 18% women have control on ICT tools through ICT. 53% women gets value added jobs and also sophisticated tasks if they have ICT education. Whereas 18% women think that ICT make more participation in ICT sector.
- At Manda, Most of the women (62%) said that access to ICT ensures more value added jobs, confidential and sophisticated jobs. At Joshodol, Most of the women said that ICT related jobs are more value added and sophisticated. From the above table, it is seen that access to ICT influences digital divide. Question was asked- *how supporting women reduce digital divide*. According to the respondents, there is a relation between digital divide and access to ICT.

4.3.7. Constraints of access to ICT:

Women in Bangladesh face enormous challenges on a regular basis, and many of the gender-specific challenges women face affect their ability to benefit from ICTs. They must conform to highly regulated roles within public and private settings, which are derived from cultural and societal norms and perceptions. In a study of USAID the constraints are described as-

Illiteracy: The literacy rate in Bangladesh is about 35 percent among the rural female population, and 57 percent among the urban female population. In addition, women tend to have more fears and pre-conceptions about technology in general compared to men.

Restricted access to and control over resources: There are distinct differences between men and women in their access to resources, information and support structures. Women usually face higher barriers than men in accessing the kinds of applied training or resources.

Training and education imbalances: Social system is male- oriented and Bangladeshi women face even more challenging circumstances where both the school system and social structure reinforce each other and work against women's equal access to training and education, from the primary level to higher education.

Economic imbalances: Less access to collateral and subsequently less access to money means they are less likely to invest in or to pay for ICT use, hindering their ability to access public and government information and services.

Inequality in working conditions and remuneration: As jobs become more technologically advanced and, in turn, better remunerated, female workers often remain clustered in low-skilled occupations with lower pay and less likelihood for training or skill upgrading(<http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan038249.pdf> accessed on 30.10.2016).

In the following table some factors which act as constraints or barriers in access to ICT have been presented. These constraints were suggested by respondents. In this issue experts also have provided suggestions. Some common factors have been identified both at rural and urban areas- illiteracy, Less control of ICT tools, economic imbalances between men and women, working environment and conditions, low remuneration and other social barriers etc.

A comparative data has been demonstrated to identify the specific barriers of rural and urban areas. Respondents were asked to mention the problems they face in accessing ICTs.

Table 4.29: Gender constraints

Constraints	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
Illiteracy	13	13	6	12	5	10	24	11.67
Access to ICT tools	30	30	15	30	10	20	55	26.67
Economic imbalances	15	15	9	18	6	12	30	15
Working conditions	25	25	7	14	5	10	37	16.33
Remuneration	7	7	8	16	12	24	27	15.67
Social barriers	6	6	5	10	7	14	18	10
Control of resources	4	4	0	0	5	10	9	4.66
Total	100	100	50	100	50	100	200	100

From above data it is identified 26.67% of the women do not have regular access to ICT tools.

Especially in urban areas women do not use ICT tools in a productive way. In rural areas, 24% respondents think that ICT usage is complicated and because of it women get less value in job.

Some respondents think that technological work is only appropriate for men. Only 4.66% women think that control of ICT resources is necessary.

The following table presents relation between constraints and access to ICTs. The relation is shown in both urban and rural areas. With the statistical value it is identified that both at urban and rural areas there are still constraints for access to ICTs. If the constraints factors are reduced, e-governance through proper access to ICT would be encouraged.

Respondents were asked that, what constraints they face in accessing to ICTs? In the table the correlation between constraints and access to ICT have a negative relation, which means that achieving e-governance is related to reducing constraints.

Table 4.30: Statistical value

Statistical function	Results
Correlation	The value of the correlation of the two variables, gender constraints and access to ICT is -0.88783 in urban areas. So data result shows a strong negative relation between constraints and access to ICT in all study areas.

The constraints are more in rural areas than urban areas. When the constraints are reduced, access to ICT is enhanced.

4.4. E-governance achievement:

E-governance is significant for the exercise of citizenship and direct public participation in Government activities, both of which are key elements in women's empowerment and achievement of gender equality. Gender-responsive governance involves the active and meaningful participation of women in all levels of decision-making and ensuring greater transparency and accountability in government (<http://www.un.org/womenwatch/daw/public/w2000-09.05-ict-e.pdf> accessed on 30.10.2016).

Respondents were asked to mention the impacts of access to ICT on achieving e-governance. They suggested some common factors, like- women through use of ICT can receive services while staying at home, women's participation in various online surveys, workshops and sharing

information, women can inform easily of crimes, disadvantages, transparency in services can be ensured, etc. Moreover, transformation in women's role is a way to achieve e-governance.

The following table shows comparative data of impact of ICTs on e-governance:

Table 4.31: E-governance achievement

Impact of ICT	Kashipur		Manda		Joshodol		Total	
	No.	%	No.	%	No.	%	No.	%
Better service	11	11	9	18	6	12	26	13.67
Women's participation	21	21	12	24	13	26	46	23.66
Maintain Peace & order	34	34	6	12	15	30	55	25.33
Transparency	14	14	8	16	5	10	27	13.34
Flow of information	9	9	6	12	6	12	21	11
Effective gender role	6	6	7	14	5	10	18	10
Effective networking	5	5	2	4	0	0	7	3
Total	100	100	50	100	50	100	200	100

- At Kashipur, 11% respondents said, access to ICT will encourage better service delivery, 21% women said that usage of ICT encourages women's involvement, most of the respondents agreed that proper use of ICT will enhance peace and order through help lines and 14% said that ICT makes services transparent, some 9% get information through ICT, 6% women think that they can contribute more through ICT and 5% think that ICT influences in effective networking.
- Among 50 respondents at Manda, 18% think that ICT equipped women will be able to avail services, 24% women think that if women access to ICT, they will get involved with ICT related jobs, 12 % women think that ICT has a great potential for maintaining

peace and order, 14% respondents think that they can perform their role more effectively by using ICTs.

- On the other hand, at Joshodol most of the women think that ICT is an instrument for maintaining peace and order, 10% women think that gender role will be more effective through ICT and can contribute in e-governance.

Respondents were asked – *How women’s access to ICT can influence achieving e-governance*. In order to find out a relation, some options were incorporated. The relation between e-governance and access to ICT has been shown in the following table:

Table 4.32: Statistical value

Statistical function	Results
Correlation	The value of the correlation of the two variables, e-governance and access to ICT is 0.99206 in urban areas. Correlation between the two factors in rural area is 0.97542. So data result shows a very strong positive relation between e-governance and access to ICT in all study areas. It means, if access is increased, e-governance will be encouraged.

From the above discussion the author came to decision that e-governance has a positive relation with women’s access to ICT. If women get support for proper use and access to ICT, they can contribute in e-governance.

Box 4.4: Contribution of ICT equipped women

Sinthia Sharmin, Age- 22years, lives at Kashipur works as computer operator. She has access to ICT tools both at home and working place. She said that, women can contribute in achieving e-governance through proper access to ICT. Such as- women can report of crime through mobile, can collect information and participate in decision making. Moreover, being a skilled human resource, they can avail ICT related jobs.

Finally the findings of this portion provide result that access to ICT tools is influential in transforming gender role. From case studies and views of experts it has been identified that women's role contributes in e-governance. Only constraints have negative relation with access to ICT. According to the correlation method, negative relation refers to opposite growth. It means if constraints are reduced, access to ICT would be accelerated.

Another finding reveals that some factors like- constraints of accessing to ICTs, education, availability of ICT tools etc. vary in rural areas. So these demonstrate a comparative scenario of level of access by women.

In this chapter all the variables have been presented quantitatively, correlation has been shown specifically and some case studies have been presented to explore the real scenario. In the next chapter the related issues of research findings will be analyzed and hypothesis will be tested.

Chapter five: Analysis of findings

5.1. Introduction:

In the previous chapter data have been presented and variables have been correlated. In this chapter opinion of respondents about supporting women in ICTs has been discussed. On the basis of the data, analysis on findings has been incorporated in this chapter.

5.2. Support access to ICT by women in urban and rural areas:

Respondents in this study have provided several opinions regarding ways of support women in ICTs. Expert's perception is also incorporated in this study.

The dominating perception is that the existing level of support is bad. Both at urban and rural areas, women opined that they don't get enough support in accessing ICT. For this women have less access to ICTs. On the other hand, regarding government initiatives, they said that:

- Support to women is increasing gradually
- Support should be given in gender specific constraints

5.2.1. Reasons for lack of support to women's access in ICT:

Regarding bad or lack of support several suggestions have been made by respondents. There are three inter-related factors that make the support ineffective:

- Socio-cultural constraints, arising from gender discriminatory patriarchal attitudes.
- Systematic inadequacy
- Lack of campaigning on government initiatives

Respondents were asked about the reasons for lack of support to women's access to ICT. They opined that the reasons are- Lack of gender specific policy, lack of area specific planning, Infrastructural development, lack of family support, mind-set of recipients, control on ICT tools

and availability of ICT tools. Among these, the most significant constraint is mind-set of women and then family support as respondents opined.

Box 5.1: Perception of women about ICTs

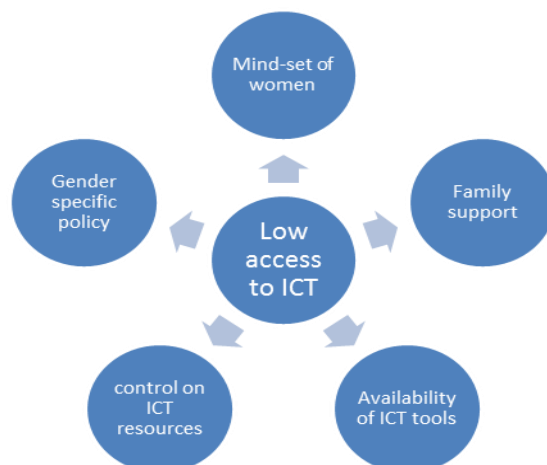
Razia Akhter, age-40years, provided some ideas regarding mind-set and family support. Those are:

- Women are resistant to change and ICT tools
- Low acceptance of ICT tools
- Lack of social support and high family responsibility

She said that, most of the women especially older women do not accept ICT easily. They are afraid of its use and resistant to new technology. Moreover, women think that they are responsible for family and household works. They do not have control on ICT resources. They use sometimes ICT devices through other members of family.

The above findings show that main barrier in access to ICT is mind-set of women. So, unsatisfactory access of women has been identified in the following figure:

Figure 5.1: Reasons of low access to ICT



5.3. Suggestions to improve women's access:

Situation may differ from rural to urban areas, but the common phenomenon is the need for specific strategies to overcome the obstacles that stand in the way of women's access to ICTs.

Some suggestions provided by respondents are- ensuring a favorable environment in family and work place, fulfillment of government projects of ICT regarding women, change in mind-set of women, minimum cost and high availability and safety of usage

Among 200 respondents a few respondents think that both fulfillment of existing government projects regarding women and ICT as well as reducing cost, making ICT tools more available at rural and urban areas are support to women for proper access to ICT.

Box 5.2: Family support to women's access to ICT

Sayma Shakila, Age-25 years, is house wife. She said that, women has several responsibilities of family and she find a little spare time to access ICT tools for searching jobs, browsing or other works. Though she has a mobile phone, but she only communicates with her relatives.

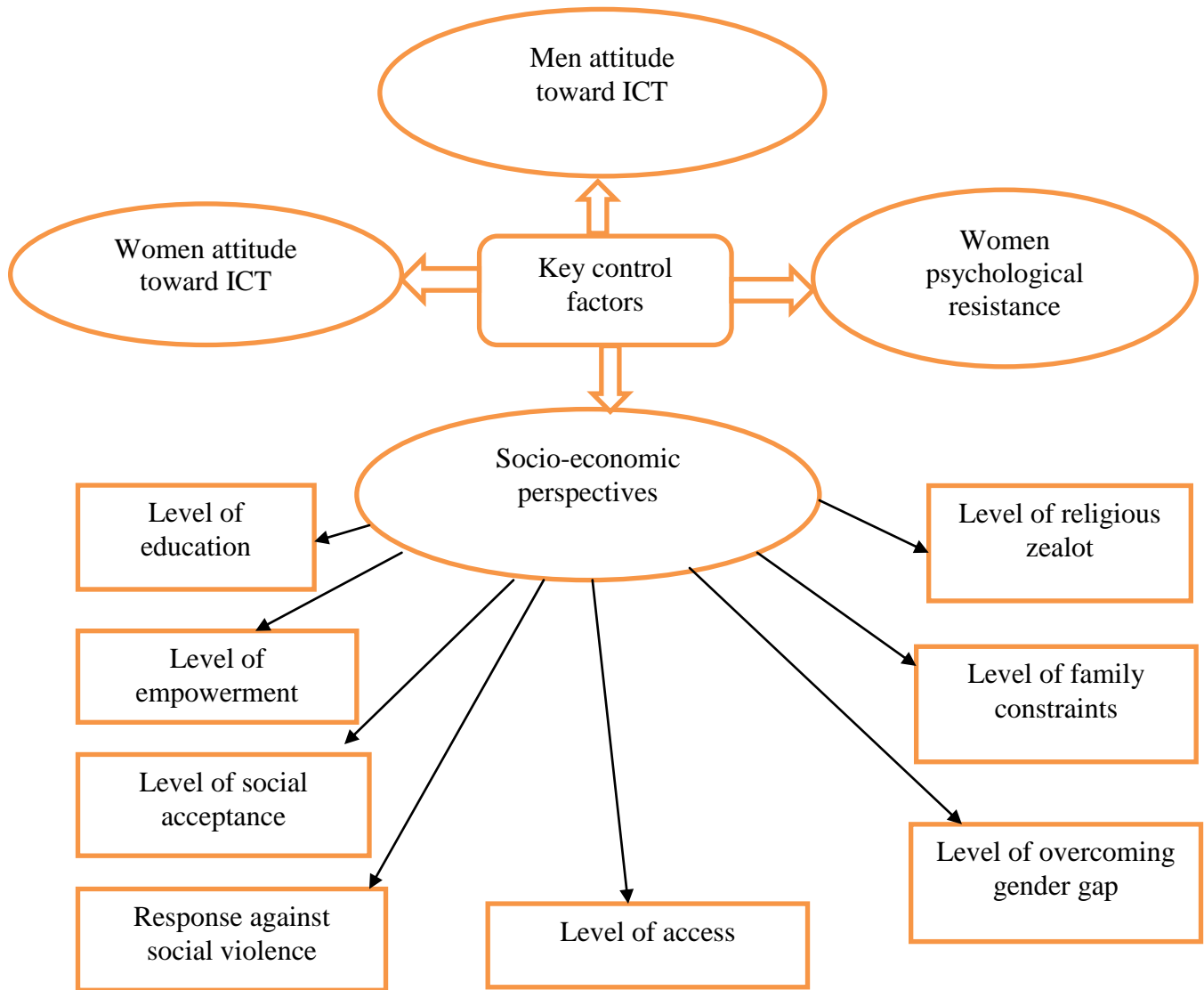
On the other hand, some women said that they do not have mobile phones. When they need to communicate, they get help of other members of family. Sometimes they find it as fashion and trends, which they think is not appropriate for older people.

The research reveals the idea that awareness of women and family support are the most important suggestion to improve access and control of ICT tools.

5.4 Discussions on findings:

In the first part of the analysis, supporting women in ICTs has been analyzed and data shows that ICT policy regarding women and ICT is one of the factors affecting women's access. Many women even do not know about recent government initiatives. Socio-economic and cultural factor is another influential factor. The findings of the study in socio-economic and cultural factors suggest several ways and urban and rural areas have different scenario.

Figure 5.2: Protocol of the identification of information indicators for Bangladeshi women



Source: The figure is derived from an article by Ahmed et. al. and modified by the author.

In the above figure the author identified some ways to bring women under protocol of information and communication technology usage. Level of access is influenced by socio-economic factors.

In terms of availability of ICT tools, there is a positive relation between access to ICT and availability of ICT tools. Moreover, in a study it is presented that:

- A computer (Premium 4 or equivalent with > 128MB or RAM) can be purchased with full accessories from Dhaka (Other cities as well) at approximately Tk. 28,000 (USD 451) for a clone computer and about Tk. 55,000-70,000 (USD 890 to USD 1,130) for a name brand computer.
- The author purchased internet connections along with computers and billed on per minute basis with costs being at the time of writing, Tk. 0.50 per minute (USD 0.008) and could drop lower during off-peak hours.
- Typical commercial cyber café are based upon a dia-up Linux computer with a PPP connection or a wireless connection to a nearby ISP or wireless client using nearby 802.11b speed spectrum transceivers/ access points and an internal local area network serving 5-10 computers.
- For “always –on-access” the typical rates are Tk. 800-1,000 per month (USD 13-16).

The above information has been compiled from a study on ICTs in Bangladesh- trends, opportunities and options for women workers by Nidhi Tandon, 2006.

In terms of digital literacy and security, there is strong relation between access to ICT and digital literacy. From the study it is very clear that in urban areas the users regularly use ICT tools like mobile without proper digital literacy. They become aware of digital security by using such tools. But at rural areas specially women are not aware of digital security or most of them do not operate these devices. They seek help of others to access if they need.

In terms of access to ICTs, respondents both at urban and rural areas highly use mobile. The number of mobile phone subscribers in Bangladesh has reached 13 million. But the study presents that most of the women use mobile phone in communicating with relatives and

entertainment. Many of the respondents suggested that only access to ICT tools will not make women contributing at e-governance, rather proper use of ICT tools will facilitate e-governance. Among 200 respondents, ICT practitioners and experts were also interviewed. Most of them expressed that e-governance would be achieved if women contribute in this stream. Experts said that e-governance has some indicators and objectives to be achieved. Women's involvement in ICTs is one of them. A continuous top management support with commitment is required to successfully implement information system with minimal resistance and smooth flow of communication among the different governmental entities (Chen & Gant, 2001).

E- Government is about transforming government to be more citizen-centered. To achieve e- Government success requires active partnerships between government, citizens and the private sector (Farelo & Morris, 2006). There exists a complex set of dynamics with citizens and how they use e- Government services which are the core concern of this study. This study reveals that women do not avail e-services because most of the women do not have access to ICTs. E-governance will not be achieved truly if women do not participate in this process.

In this chapter some analyses on related issues have been included for clarification. In the next chapter, hypothesis will be tested depending on result of data analysis.

Chapter Six: Test of research hypothesis and concluding remarks

6.1. Introduction:

In order to draw the relationship among the different variables, test of hypothesis is included in this chapter. In this study, hypothesis has been formulated reviewing the findings of different studies as well as from field observations. For testing hypothesis correlation, chi square test have been used in this study.

6.2. Test of research hypothesis based on findings:

In this section, important findings related to assumed hypothesis have been summarized and described in order to draw conclusions whether the assumed research hypothesis could be accepted or not. A summary of findings against the research hypothesis is presented in the following table:

Table 6.1: Summary of relevant findings against research hypothesis

Research hypothesis	Relevant findings	Conclusion
The process of E-Governance in Bangladesh could be enhanced by supporting women access to ICT.	The value of the correlation of the two variables, e-governance and women's access to ICT is 0.99206 in study areas. So, there is a high positive relation between women's access to ICT and e-governance.	The hypothesis can be accepted
	The value of the correlation of the two variables, digital divide and access to ICT is -0.93006 in study areas. So, there is an opposite relation between the two factors. If digital divide is reduced, e-governance will be enhanced.	

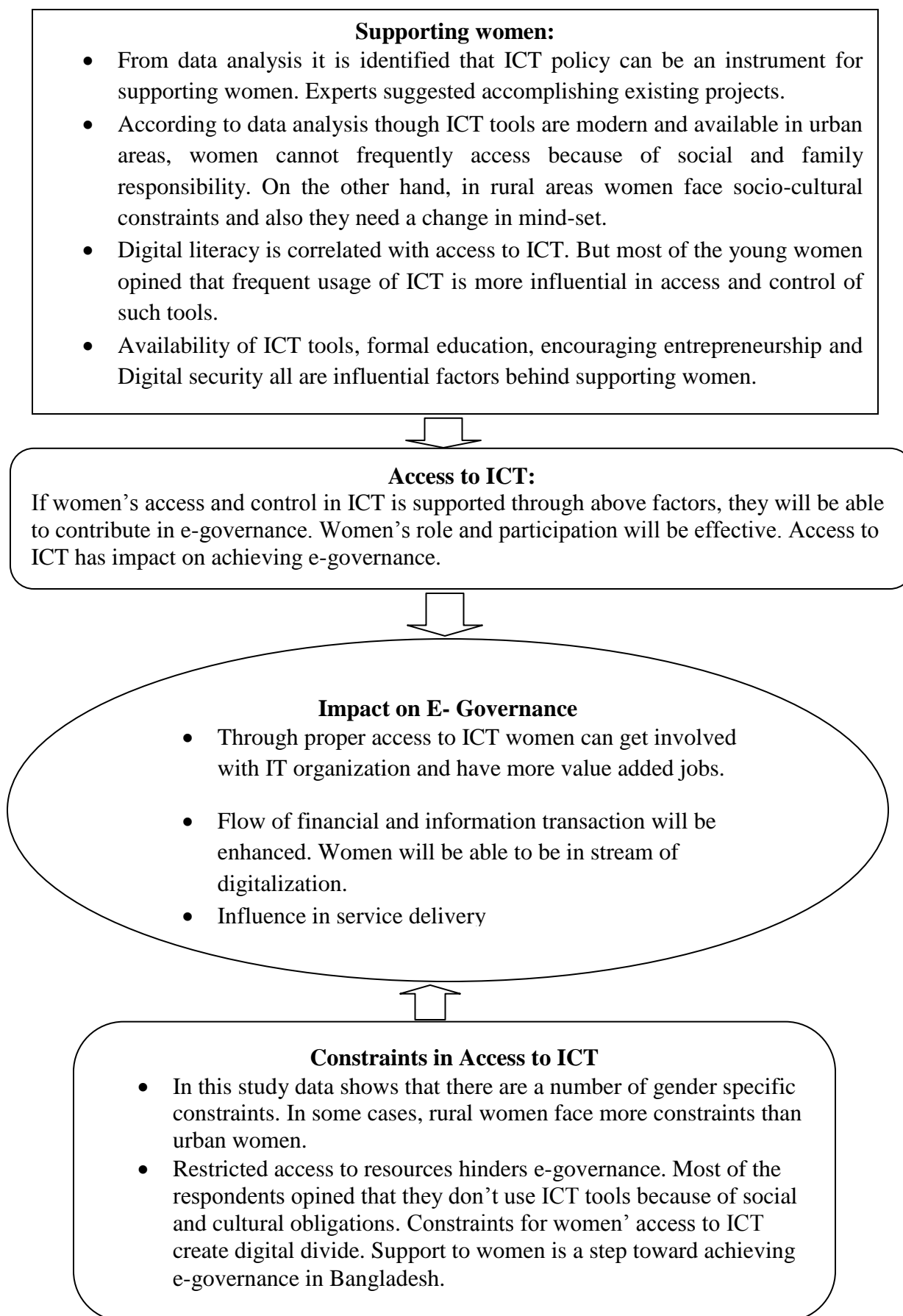
	<p>The value of the correlation of the two variables, gender role and access to ICT is 0.98885. It shows, the two factors have strong relation.</p>	
	<p>The value of the correlation of the two variables, entrepreneurship and access to ICT is 0.99902 in study areas. Supporting entrepreneurship may accelerate e-governance.</p>	
	<p>The value of the correlation of the two factors, socio-economic and cultural factors and access to ICT is 0.99483 in study areas. So, there is highly positive relation. Socio- economic and cultural factors influence access to ICT.</p>	
	<p>The value of the correlation of the two variables, empowerment and access to ICT is 0.99844 in study areas. It shows strong relation between the two factors.</p>	
<p>Improvement in technological knowledge and creating awareness will decrease constraints for women's access to</p>	<p>Among 200 respondents 62% women have opined that effective ICT policies influence on access to ICT. According to most of the respondents, awareness about policy initiatives encourages access to ICTs.</p>	<p>The hypothesis can be accepted</p>
	<p>The value of the correlation of the two variables, communication skill and access to ICT is</p>	

ICT in Bangladesh.	0.99979 in study areas. So there is a high positive relation between communication and access to ICTs.	
	The value of the correlation of the two factors, digital literacy and access to ICT is 0.65465 in study areas. It shows that providing digital literacy encourages access to ICT.	
	The value of the correlation of the two variables, digital security and access to ICT is 0.85044 in both urban and rural areas, which is a strong relation. Providing digital security will encourage access to ICT.	
	The value of the correlation of the two variables, involvement in ICTs and access to ICT is 0.99977 in study areas. If involvement increases, access and control of ICT tools will increase.	

Women face enormous constraints for accessing ICT tools, but the scenario is little different in rural areas of Bangladesh. Rural women lack access and control of ICT tools. Most of the respondents are not aware of ICT initiatives. On the other hand, urban women get privileges of ICT. Still women in these areas do not have regular access other than entertainment and communication. This is digital divide which hinders the process of e-governance.

A figure has been added below to proof the conceptual analysis of the study:

Figure 6.1: Conceptual framework



After above discussions on conceptual and theoretical framework it is clear that women's access has impact on e-governance. In this study, women's access to ICT means proper usage of ICT tools. E-governance has many indicators and parameters. In the present study, the author does not mean that women's access to ICT is the only parameter of achieving e-governance. But it has influence on achieving the goal of "Digital Bangladesh".

According to gender role theory, men and women have specific role and their needs should be addressed accordingly. The author in this research has tried to find out the constraints of access to ICT. These constraints are different in rural and urban areas. In this study, it is identified that if technological support and availability of ICT tools are ensured, women will be able to contribute through their role in formal and informal institutions.

6.3. Suggestions:

A number of recommendations have been suggested even by respondents and experts during the data collection. Some conceptual and policy recommendations are as follows:

According to the suggestions of ICT practitioners and respondents, supporting refers-

- ICT tools should be available, cheap and remain within limit of average purchasing power
- To promote usage of ICT tools even in rural areas
- To ensure simplicity and friendly applications by ICT tool providers
- To increase awareness about ICT tools. "ICT tools are not complicating task, rather it lessen complexity"
- To attract for productive use of ICTs rather than entertainment and other misuses
- To provide gender sensitive cyber security

- To encourage women for entrepreneurship and economic empowerment
- To ensure continuity of e-services

Some other recommendations-

- Mobile telephone is a factor of women's huge access to information without literacy- but illiteracy is nonetheless an obstacle to women's contribution in the knowledge economy. If e-governance is to be promoted, women should be taught the positive usage of mobile and mobile apps through enormous campaigning.
- ICTs are an important interactive tool of education and need to be introduced into all forms of formal and informal peer learning. Distance education through ICTs also presents an important opportunity for the time-constrained women.
- The policy makers should keep the three dimensions of ICTs (Connectivity, computing and commerce) in mind in all gender and development work. Only being connected through mobile phones is not ICT equipped women.
- If women are to be supported, government will need gender specific data, which is still limited in some indicators of census. Collection and analysis of sex- disaggregated data by government ministries, private sector, NGOs and donors regarding ICT usage are necessary.
- Review and revision of Bangladesh's National ICT policy needs to include gender analysis and recommendations throughout the document, to incorporate ICTs as a cross-cutting factor of development.
- Policies should be taken for workshops, training, and other awareness building programs with rural women.

6.4. Conclusion:

The introduction of ICTs into the daily lives and activities of women in Bangladesh represents an extraordinary opportunity to meet their practical needs and interests. As women's access to ICTs is an important value proposition in terms of their employability in the ICT sector, policy makers should not automatically equate employment with empowerment. Policies and programs need to ensure that women understand the full economic and social implications of working with ICTs and support them to adopt ICTs as a launch-pad for their education, skill- building and empowerment in a speedy and systematic way. In this study, it is found that most of the women use mobile phones to communicate and young women find it as an instrument of entertainment. But the greater usage and potentiality of ICTs is still not familiar to them. If e-governance is to be achieved effectively, ICT should be utilized productively. Women can use ICT tools for improving daily lives, business and exchange information. In a word, women of Bangladesh may contribute in the e-governance through effective use of ICT. Women can adopt ICTs, the new factors of development as equal stakeholder of knowledge economy. All it needs, to support women through increasing awareness, attracting for entrepreneurship, cyber security, economic empowerment, availability of ICT tools in rural areas and a change in mind-set, etc.

However, the present study makes room for further research and facilitates more in-depth analysis on constraints for supporting women in ICTs, Inclusive e-governance and policy implementation, etc. For better understanding of research problem a vast study can be performed on several urban and rural areas of Bangladesh.

Bibliography

Books and Documents:

Aminuzzaman, S. M. 2011, Essentials of Social Research, Osder Publication, Dhaka.

Field, T. 2003, The E- Government imperative, OECD, Paris, France.

Hamid, Shamim 1996, Why women count: Essays on women in development in Bangladesh, University Press limited, Dhaka.

Mahtab, Nazmunnessa 2012, Women, Gender and development contemporary issues, A H D Publishing House, Dhaka.

Journal and papers:

Atiqur, Rahman, M. N. Abdullah, Amran Haroon, Rahat Bari Tooheen 2013, ICT impact on socio- economic conditions of rural Bangladesh, Journal of World Economic Research, 2013; 2(1), pp: 1-8.

Azad, B. & Faraj, S. 2008, Making e- Government systems workable: Exploring the evolution of frames. Journal of Strategic Information Systems, 17, (2), pp. 75–98.

Badri, M.A. & Alshare, K. 2008, A path analytic model and measurement of the business value of e- government: An international perspective. International Journal of Information Management, 28, (6), pp. 524–535.

Banerjee, P. & Chau, P.Y.K. 2004, An evaluative framework for analysing e- government convergence capability in developing countries. Electronic Government- an International Journal, 1, (1), pp. 29–48.

Basu, S. 2004, E- government and developing countries: An overview. *International Review of Law, Computers & Technology*, 18, (1), pp. 109–132.

- Bhatnagar, S. 2002, E- government: Lessons from implementation in developing countries. *Regional Development Dialogue, UNCRD*, (24), pp. 1–9.
- Brown, C. & Czerniewicz, L. 2010, Debunking the 'digital native': Beyond digital apartheid, towards digital democracy. *Journal of Computer Assisted Learning*, 26, (5), pp. 357–369.
- Chan, C.M.L., & Pan, S.L. 2008, User engagement in e- government systems implementation: A comparative case study of two Singaporean e- government initiatives. *Journal of Strategic Information Systems*, 17, (2), pp. 124–139.
- Colesca, S.E. & Dobrica, L. 2008, Adoption and use of e- government services: The case of Romania. *Journal of Applied Research and Technology*, 6, (3), pp. 204–217.
- Cooks, L.M., Isgro, K. 2003, “A space less traveled: Positioning gender in information and communication technology. *ICT development, Feminist Media Studies*, Vol. 3, November, pp: 347-351
- C. Avgerou 2000, Recognizing Alternative Rationalities in the Development of Information Systems, *The Electronic Journal on Information Systems in Developing Countries*, Vol. 3, pp: 1-15
- Dada, D. 2006, E-Readiness for Developing Countries: Moving the Focus from the Environment to the Users, *Electronic journal of information systems in developing countries (EJISDC)*, 27(6): 1-14.
- Das, J., Burbridge, J. & DiRienzo, C. 2008, Global e- government and the role of trust: A cross country analysis. *International Journal of Electronic Government Research*, 5, (1), pp. 1–18.

- Dwivedi, Y.K., Khan, N. & Papazafeiropoulou, A. 2007, Consumer adoption and usage of broadband in Bangladesh. *Electronic Government- an International Journal*, 4, (3), pp. 299–313.
- Gasmelseid, T.M. 2007, A Multi- agent Service- Oriented Modeling of E- Government Initiatives. *International Journal of Electronic Government Research*, 3, (3), pp. 87–106.
- Ghapanchi, A., Albadvi, A. and Zarei, B. 2008, A framework for e- government planning and implementation. *Electronic Government- an International Journal*, 5, (1), pp. 71–90.
- Goh, D.H.L., Chua, A.Y.K., Luyt, B., & Lee, C.S. 2008, Knowledge access, creation and transfer in e- government portals. *Online Information Review*, 32, (3), pp. 348–369.
- Hafkin, J.N. 2011, Women and Gender in ICT: Statistics and Indicators for Development, *Information Technologies and International Development (ITID)*, 4(2): 25-41.
- Heeks, R., & Bailur, S. 2007, Analyzing e- government research: Perspective, philosophies, theories, methods, and practice. *Government Information Quarterly*, 24, (2), pp. 243–265.
- Holliday, I. 2002, Building E- government in East and Southeast Asia: Regional rhetoric and national (in) action. *Public Administration and Development*, 22, (4), pp. 323–335.
- Kumar, A. 2001, Bridging the digital divide- some efforts from Kerala, the paper was presented at Katmandu in International Conference on Information Technology, Communications and Development, 29-30 Nov. 2001.

S. Bhatnagar 2000, Social Implications of Information Communication Technology in Developing Countries: Lessons from Asian Success Stories, The Electronic Journal on Information Systems in Developing Countries, Vol. 3, 1-15.

Reports and studies:

Anitha, Gurusurthy 2003, Bridging the Digital Gender Divide: Issues and Insights on ICT for Women's Economic Empowerment, United Nations Development Fund for Women (UNIFEM).

a2i. 2011, Strategic Priorities of Digital Bangladesh, Dhaka, Access to Information (a2i), http://www.a2i.pmo.gov.bd/tempdoc/Strategic_Priorities_of_Digital_Bangladesh_Jan_2011.pdf on 10.03.2016.

Dutta, S. and Bilabao-Osario, B. (eds) 2012, *The Global Information Technology Report 2012*. Living in a Hyper connected World. Geneva: World Economic Forum (WEF) and INSEAD.

E. Talero, and P. Gaudette 1996, Harnessing Information for Development- A proposal for a World Bank Group Strategy, Washington, D.C, 1996.

Hanna 1991, The Information Technology Revolution and Economic Development, World Bank Discussion Paper Washington, D.C, 1991.

John, Gage 2002, Some Thoughts on How ICTs could really change the World, The Global Information Technology Report, 2001-2002, World Economic Forum, New York Oxford Press, 2002.

GED 2010, Outline Perspective Plan of Bangladesh 2010-2021: Making Vision 2021 a Reality. Dhaka, General Economics Division (GED), Planning Commission, Ministry of Planning, Government of the People's Republic of Bangladesh.

IGC 2011, ICT Data Need in Bangladesh- a draft report by for the International Growth Centre (IGC).

IGS 2010, The State of Governance in Bangladesh 2009: Entitlement, Responsive, Sustainability, Dhaka, Institute of Governance Studies (IGS), BRAC University.

ITU 2012, Measuring Information Society, Geneva, International Telecommunication Union.

ITU 2005, Measuring ICT: The global status of ICT indicators, Partnership on Measuring ICT for Development. Geneva: International Telecommunications Union (ITU), Paper available online at <http://www.itu.int/ITU-D/ict/partnership/material/05-42742%20GLOBAL%20ICT.pdf> (Accessed on 29/12/2012).

UNDP/UNIFEM 2004, Bridging the gender digital divide: A report prepared on gender and ICT, www.web.undp.sk accessed on March 10,2016.

United Nations Development Programme (UNDP) 2001, Human Development Report 2001: Making new technologies work for human development. New York. <http://hdr.undp.org/reports/global/2001/en/> seen on 03.10.16.

United States Agency for International Development (USAID) 2004, Information and Communication Technology for Development: USAID Worldwide Program. Bureau for Economic Growth, Agriculture and Trade, Washington, D.C.

Electronic publication:

www.unpan1.un.org/intradoc/groups/public/documents/apsity/unpan038251.pdf accessed on 10.09.2016.

https://en.wikipedia.org/wiki/Information_and_communications_technology accessed on 10.09.2016

<http://www.unesco.org/new/en/communication-and-information/resources/news-and-in-focus-articles/in-focus-articles/2007/women-and-ict/> accessed on 10.09.2016

<http://bbs.gov.bd/PageWebMenuContent.aspx?MenuKey=332> accessed on 28.09.2016

Asian and Pacific Center for transfer of Technology

<http://www.unescap.org/esid/GAD/events> accessed on 10.09.2016

ELDIS ICT for Development <http://incomunicado.info/aggregator/sources/22> accessed on 12.09.2016

Gender Equality between Men and Women – an ILO vision

<http://www.ilo.org/public/english/gender.htm> accessed on 12.09.2016

Women's ICT-Based Enterprise for Development project <http://www.womenictenterprise.org> accessed on 10.06.2016

The South Asian Women's Network <http://www.sawnet.org> accessed on 10.06.2016

CEDEFOP: Generic ICT Skills Profiles http://www.career-space.com/downloads/allprofiles_2205_EN.pdf accessed on 10.06.2016

GEM: Gender Evaluation Methodology for Women and ICTs—A Learning Tool for Change and Empowerment; <http://www.apcwomen.org/gem/index.htm> accessed on 10.06.2016

National Institute for Women in Trades, Technology and Science <http://www.iwitts.com> accessed on 10.06.2016

International Telecommunications Task Force on Gender Issues <http://www.itu.int/ITU-D/gender/> accessed on 10.06.2016

Development Gateway <http://topics.developmentgateway.org/ict> accessed on 29.06.2016

LCG Bangladesh - forum for donor coordination – click on sub group WAGE for gender issues

<http://www.lcgbangladesh.org> accessed on 29.06.2016

USAID ICT projects inventory <http://www.dec.org/partners/ict/ICTsearch.cfm> accessed on 29.06.2016

**Appendix-A
Research Questionnaire**

Supporting women in ICTs: A step toward achieving E-governance in Bangladesh

Date:

No. of respondent:

Dear Respondent,

This is a research study. This study is on women's level of access to ICT and its impact on E-governance. During the study, please feel free to ask questions at any time. If you agree to participate in this study, you will be asked to complete a three- part survey concerning your observation and experiences on usage of ICT tools and E-governance.

Your participation in this study is completely voluntary and you have the right to refuse to participate or leave the study at any time. You can skip any question you do not feel comfortable answering.

Do you agree to participate in this study?

- Yes
- No

Thank you for agreeing to take part in this research survey. This survey will take 10-15 minutes. Thank you again for your time and cooperation.

Objectives:

1. To identify the perception about usage of ICT tools for enriching E- governance
2. To explore the real scenario of ICT usage in urban and rural area of Bangladesh
3. To recommend how women be supported for proper utilization of ICTs

Part- A

Respondent's particulars

Instructions: Please put a tick in the box next to the answer of your choice or write in the space provided. Though your name and other personal information are documented, those will strictly confidential and not published.

1. Name:
2. Gender: Male Female
3. Age(In years):
4. Address:
5. Area: Urban/ Rural/ Semi-urban

6. Educational qualification:
- a. Literate(No schooling)
 - b. Illiterate
 - c. Secondary level
 - d. Higher secondary level
 - e. Graduation
 - f. Post-Graduation
 - g. Technical education
 - h. Others.....

7. Marital status:
- a. Married
 - b. Unmarried
 - c. Others

8. Employment status
- a. Not employed
 - b. Employed
 - c. Self- employed
 - d. Others

9. Work and job related information:

Designation & experience	Job responsibilities	Monthly income

10. Other information:

Information about	Response
Number of family members	
Religion	
Family income (monthly)	
Involvement with organization	

Part- B
Supporting women in ICTs

1. What do you know about ICT and use of it?
.....
.....
2. What kind of ICT tools do you use?
.....
3. How many ICT tools do you use regularly?
.....
4. Where do you use ICT tools mostly?
a. Home b. Office/ work place c. others.....
5. On what purpose do you use ICT tools?
a. Communication
b. Entertainment
c. Internet browsing/ information
d. Services (Billing, banking and purchase, etc.)
e. Others.....
6. Do you think that ICT tools are utilized properly?
a. Yes
b. No

If no, what are the reasons of misuse of ICT tools?
.....
7. Do you know about recent government initiatives such as, UDC?
a. Yes
b. No
c. Not interested
8. What kind of social factors influence access to ICT?
a. Tie and Cost
b. Family responsibility
c. Awareness
d. Public Space
e. Complexity
f. Environment
9. Do you think that your working environment is enough supportive for usage of ICT?
a. Yes
b. No

If yes, what kind of support you get?

Part-C

The relation between E-governance and supporting women

1. What is E-governance?
.....
.....
2. Is there any relevance between E-governance and gender role of women?
 - a. Yes
 - b. NoIf yes, please mention the relevance:
.....
.....
3. What is your opinion regarding present scenario of women's access in ICTs?
.....
.....
4. Do you think the scenario of women's access is different in urban and rural areas?
 - a. Yes
 - b. No
5. What are the necessary steps for supporting women in ICTs?
.....
.....

Thank you for your precious time and cooperation.

Appendix-B
Map of Manda, Dhaka



Appendix-C
Map of Kashipur, Barisal



Appendix-D
Map of Kishoregonj

